Vol. 1038 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 31, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 31, 1984 Volume 1038 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. The search fee for the European Patent Office was changed as of Jan. 22, 1983 and was announced at 1025 O.G. 27 on Dec. 28, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	295.00
Basic Supplemental Fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Nov. 14, 1983. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Dec. 1983

Affirmed	136
Affirmed in Part	13
Reversed	47
Total	196

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,314,236, Re. S.N. 516,614, Filed July 22, 1983, Cl. 340/384E, APPARATUS FOR PRODUCING A PLURALITY OF AUDIO SOUND EFFECTS, Steven T. Mayer, et al., Owner of Record: *Atari, Inc., Sunnyvale, Calif.,* Attorney or Agent: Michael L. Sherrard, Ex. Gp.: 234

4,376,997, Re. S.N. 550,980, Filed Nov. 14, 1983, Cl. 369/270, SPINDLE ASSEMBLY, Frederick S. Eggers, Owner of Record: *Pro Quip, Inc., Santa Clara, Calif.,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 246

4,385,136, Re. S.N. 556,170, Filed Nov. 29, 1983, Cl. 523/215, REINFORCEMENT PROMOTERS FOR FILLED THERMOPLASTIC POLYMERS, Fred Happoth Ancker, et al., Owner of Record: *Union Carbide Corp., New York, N.Y.,* Attorney or Agent: Eugene C. Trautlein, et al., Ex. Gp.: 142

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

National Inventors Day

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 11, 1984 from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 12, 1984 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 12, at 2:00 p.m.

In order to assemble exhibits it will be necessary to close the Search Room on Friday, Feb. 10, 1984 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF,
Dec. 27, 1982. *Commissioner of Patents, and Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Mar. 9, 1984.

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Registers of Attorneys and Agents

In the May 17, 1983 issue of the *Official Gazette*, there was published a list of names and addresses of persons whose names had been removed from the Registers of Patent Attorneys and Agents pursuant to the provisions of 37 CFR §1.347.

The following persons, whose names appeared in that list, have been reinstated on the active Register of Attorneys or Register of Agents, in view of information which they have furnished to the Office of Enrollment and Discipline.

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Jan. 5, 1984. *Director, Office of Enrollment and Discipline.*

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Wall, Thomas J., Bruns & Jenney, 512 Hills Bldg., Syracuse, N.Y. 13202
Watson, Harry J., Qualley, Larson & Jones, 1400 Pierce St., Sioux City, Iowa 51105
Wedding, Donald K., 4533 Wedgewood Ct., Toledo, Ohio 43615
White, Stuart A., Curtis, Morris & Safford, 530 Fifth Ave., New York, N.Y. 10036
Williams, Chester A., Jr., R.D. 2, Box 472, Stockton, N.J. 08539
Williamson, Arba G., Jr., 40 Swallow Hill Rd., Carnegie, Pa. 15106
Wills, Thomas R., UOP Process Division, 20 UOP Plz., Des Plaines, Ill. 60016
Wilson, Thomas A., 1117 N. Luna Cir., Santa Fe, N. Mex. 87501
Woodbridge, Richard C., Mathews, Woodbridge, Goebel, Laughlin & Reichard, 357 Nassau St., Princeton, N.J. 08540
Wornoff, David S., 11 Twelve Oaks Trail, Ormond Beach, Fla. 32074
Yakes, John C., 320 Palo Alto Ave., Suite A-1, Palo Alto, Calif. 94301
Young, Barry N., Kerkam, Stowell, Kondracki & Clarke, Crystal Gateway One—Suite 411, 1235 Jeff. Davis Hwy., Arlington, Va. 22202

Notice of Public Briefing on Patent Maintenance Fee Payment Procedure

The Patent and Trademark Office is in the process of designing and implementing a system for receiving and recording maintenance fees which are required for patents based on applications filed on and after December 12, 1980. Provisions relating to maintenance fees are found in both Public Laws 96-517 and 97-247. A proposed rule change notice is also being prepared.

It is considered to be extremely desirable to have a close coordination between the procedures and records maintained in the Patent and Trademark Office and those maintained by organizations and individuals responsible for paying maintenance fees including service organizations.

Accordingly, the Patent and Trademark Office is presenting a public briefing of its maintenance fee payment plans on February 22, 1984 at 1:00 pm at the Crystal City Marriott Hotel, 1999 Jefferson Davis Highway (U.S. Rt. 1), Arlington, Virginia 22202.

Any questions concerning the briefing should be addressed to R. Franklin Burnett at (703) 557-3054.

Gerald J. Mossinghoff
Commissioner of Patents and Trademarks

Jan. 17, 1984
Date

Status of PTO Services

The following is an update of the status of PTO services for December 1983 :

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	34	Problems were encountered in conversion to the new computer system.
Patent-Trademark Copies:	30	32	
Window Coupons	5	92% within 5 days	
Mail Coupons	29	100% within 15 days	
Letter Orders	34	100% within 20 days	
Date of oldest unfilled order		Nov. 14, 1983	
Certified Copies:			
Trademark Registrations	30	12	
Applications-As-Filed	20	100% within 15 days	
File-Wrapper/Contents	N/A	100% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	15	
Filing Reg. Certificates	3	4	
Assignments:			
Patents	25	20	
Trademarks	25	14	
Avg. Days from Issue Fee Payment to Issue Date	90-100	91	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 1 day late	
Patent Copies Available	Issue Date	Avg. 11 days late	Problems being resolved.
Trademark Official Gazette:			
In Bookstore	Issue Date	On Schedule	
Mailed	Issue Date	On Schedule	
Trademark Regs. Mailed	Issue Date	On Schedule	

Jan. 9, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 31, 1984

Re. 31,437	4,386,350	4,403,243	4,412,305
4,060,716	4,387,370	4,403,748	4,413,047
4,084,428	4,388,927	4,404,755	4,413,455
4,168,722	4,390,208	4,404,848	4,413,990
4,192,859	4,393,401	4,405,839	4,414,625
4,283,566	4,393,631	4,406,792	4,414,756
4,303,611	4,397,644	4,406,875	4,414,785
4,325,952	4,397,950	4,407,285	4,414,795
4,342,298	4,398,313	4,407,990	4,414,818
4,343,314	4,398,463	4,407,992	4,415,153
4,346,946	4,399,299	4,408,011	4,415,287
4,347,562	4,399,461	4,409,131	4,415,312
4,354,176	4,399,793	4,409,437	4,415,401
4,354,932	4,400,265	4,410,127	4,415,660
4,359,417	4,400,472	4,410,664	4,415,984
4,368,541	4,400,485	4,410,908	4,416,382
4,374,834	4,400,509	4,411,176	4,416,498
4,380,570	4,400,728	4,411,900	4,416,873
4,382,290	4,401,669	4,412,031	4,417,221
4,384,875	4,402,343	4,412,175	
4,385,646	4,402,372	4,412,302	

Disclaimers

3,918,259.—*Cyril W. Habiger* and *Donald L. Hopkins*, Joliet, Ill. HORSEPOWER-LIMITING VALVE AND LINKAGE THEREFOR. Patent dated Nov. 11, 1975. Disclaimer filed Dec. 5, 1983, by the assignee, *Caterpillar Tractor Co.*,

Hereby enters this disclaimer to claims 1, 2, 5, 6, 7 and 10 of said patent.

4,403,820.—*Donald S. Rich*, Long Valley, N.J. CONNECTOR FOR TERMINATING UNDER-CARPET SIGNAL TRANSMISSION CABLE. Patent dated Sept. 13, 1983. Disclaimer filed Nov. 30, 1983, by the assignee, *Thomas & Betts Corp.*

Hereby enters this disclaimer to claims 9 and 21 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390 Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

JANUARY 31, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

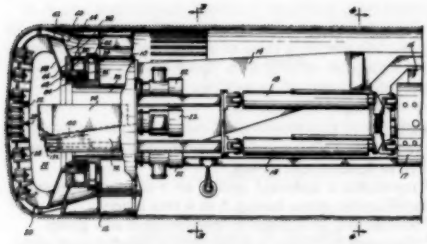
Re. 31,511
ROTARY CUTTERHEAD FOR AN EARTH BORING MACHINE

Barry A. Spencer, Redmond, Wash., assignor to The Robbins Company, Kent, Wash.

Original No. 4,193,637, dated Mar. 18, 1980, Ser. No. 931,384, Aug. 7, 1978. Application for reissue Nov. 5, 1981, Ser. No. 318,618

Int. Cl.³ E21C *25/16*

U.S. Cl. 299—56 23 Claims



1. A main frame for a rotary cutterhead of an earth boring machine, said main frame comprising:

an annular box beam by which the cutterhead is mounted onto an earth boring machine, for rotation about an axis of rotation;

a box-like hub structure comprising peripheral wall means defining a center space;

a plurality of radial spoke beams having inner ends which are integrally connected to the peripheral wall means of the hub structure and outer ends which are integrally connected to the annular box beam, each said radial spoke beam comprising a pair of spaced apart side plate members;

roller cutter mounts within said radial spoke beams comprising wall members which extend transversely of the radial spoke means and are integrally connected at their ends to the spaced apart side plate members, to also function as structural brace members for the radial spoke beams;

wherein the cutter mounts are adapted for installation and removal of roller cutters from the rear side of the cutterhead, and

wherein said main frame is configured to provide an interior space for a workman which is large enough to provide room for installation and removal of roller cutters from behind the cutterhead.

Re. 31,512
PSEUDOTRISSACCHARIDES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS MEDICAMENTS

Peter Stadler, Haan; Karl G. Metzger, Wuppertal; Eckart Voss, Cologne; Uwe Petersen, Leverkusen; Hans-Joachim Zeiler, Velbert, and Hans-Joachim Kubbe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

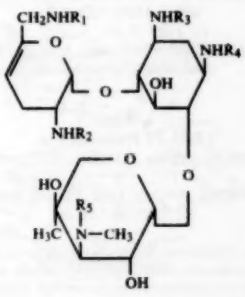
Original No. 4,235,888, dated Nov. 25, 1980, Ser. No. 52,871, Jun. 28, 1979. Application for reissue May 6, 1981, Ser. No. 260,853

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832268

Int. Cl.³ A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 9 Claims

13. A compound according to the formula



wherein R_1, R_2, R_3, R_4 and R_5 independently represent a radical selected from the group consisting of hydrogen, 2,3,4-trihydroxypentyl-, 3,4,5-trihydroxypentyl-, 2,3,4,5-tetrahydroxypentyl-, 2,4,5-trihydroxyhexyl-, 4,5,6-trihydroxyhexyl-, 2,3,4,5-tetrahydroxyhexyl-, 3,4,5,6-tetrahydroxyhexyl-, 2,4,5,6-tetrahydroxyhexyl-, 4,5-dihydroxypent- 2-en-1-yl, 4,5-dihydroxy-hex-2-en-1-yl and 4,5,6-trihydroxy-hex-2-en-1-yl-, with the proviso that at least one of the radicals R_1 to R_5 being other than hydrogen.

Re. 31,513
BLANCHING, PASTEURIZING AND STERILIZING PROCESS AND APPARATUS SUITABLE THEREFOR

Donald H. G. Glen, 83 Merivale St., Tumut, New South Wales, Australia

Original No. 4,255,459, dated Mar. 10, 1981, Ser. No. 11,365, Feb. 12, 1979. Application for reissue Nov. 26, 1982, Ser. No. 444,380

Claims priority, application Switzerland, Feb. 10, 1978, 1483/78

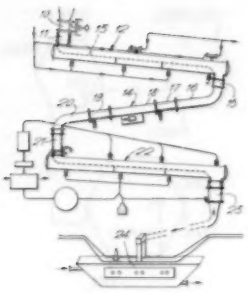
Int. Cl.³ A01G *1/04*

U.S. Cl. 426—521 4 Claims

1. A continuous process for the rapid blanching and sterilization of foodstuffs in particulate form, such as portions of fruit, vegetables, meat or fish, which comprises continuously moving said foodstuff particles *in a* first *zone* through an elongated pressure chamber where [it is] *the same are* subjected under pressure to hot steam or gas *at a temperature and for a time sufficient* to rapidly heat the outer portion thereof [an] *and* to supply *thereto* sufficient heat to heat the foodstuff particles

when spread throughout *the same* to the sterilization temperature thereof, then moving the thus heated foodstuff particles *in a second zone* through an elongated chamber where the pressure drops and said particles are maintained under *essentially* adiabatic conditions until the particles attain the sterilizing temperature throughout for the time necessary to inactivate or destroy the microorganisms and enzymes *and thus sterilize the food particles*, then moving the *thus sterilized* particles of foodstuff *in a third zone* through a cooling unit to effect cooling of the product, *and* moving the cooled product through an enclosed conveying system to a packing unit where it can be packed asceptically, [all of the] movement of the foodstuff particles being effected at least partly by gravity feed.

2. Apparatus for carrying out the *continuous* process of rapid [heat] blanching *and sterization* of foodstuff particulates



which comprises an elongated *gas or* steam pressure chamber through which the foodstuff first moves, an adjacent elongated chamber *connected to said pressure chamber and being* under a pressure lower than *that of* said *gas or* steam pressure chamber through which the foodstuff next moves and wherein the pressure drops while the foodstuff is adiabatically [heated] *equilibrated throughout to the sterilization temperature thereof*, a cooling unit connected to said adjacent elongated chamber through which the adiabatically [heated] *equilibrated and sterilized* foodstuff then passes and is there cooled, and an elongated enclosed conveying system connected to said cooling unit and to a packing unit for conveying the foodstuff to the packing unit, [all of] said chambers and units being connected and angled to [give a] *effect movement of the foodstuff particles at least partly by* gravity feed.

Re. 31,514

PHOTOGRAPHIC MATERIAL CONTAINING A STABILIZER

Gerhard Jäger, Leverkusen; Anita von König, Krefeld; Armin Voigt, Cologne, and Karl H. Büchel, Burscheid, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

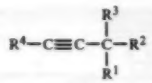
Original No. 4,256,830, dated Mar. 17, 1981, Ser. No. 961,217, Nov. 16, 1978. Application for reissue Aug. 4, 1982, Ser. No. 405,069

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752046

Int. Cl.[3] **G03C** *7/26, 7/30, 1/34*

U.S. Cl. 430—372 **9 Claims**

1. Light sensitive color photographic material having at least one silver halide emulsion layer, of improved stability and containing grains for formation of an image upon imagewise exposure, and said material having associated with said silver halide layer [a color developer and] color-*forming* compounds and at least one stabilizing compound, wherein the improvement comprises the stabilizing compound of the following general formula or a salt thereof:



in which

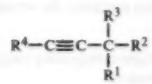
R^1 represents a substituted or unsubstituted alkyl, aryl, aralkyl, or heterocyclic group,

R^2 represents a hydroxyl group, or a nitrogen-containing heterocyclic group having 5 or 6 ring atoms.

R^3 represents a substituted or unsubstituted aryl group

R^4 represents hydrogen, a substituted or unsubstituted alkyl, aryl or dialkylamino alkyl group, a morpholinomethyl group or an N-pyrrolidinyl methyl group, provided that at least one of the groups R^1 and R^2 is a heterocyclic group.

8. In a process for the production of color photographic images by imagewise exposure of color photographic material which contains at least one silver halide emulsion layer, having associated therewith [color] *color-forming* compounds and development and stabilization of the silver halide against fog, [the] the improvement according to which development is carried out with a composition containing a developer and at least one compound corresponding to the following formula or a salt thereof:



in which

R^1 represents a substituted or unsubstituted alkyl, aryl, aralkyl, or heterocyclic group,

R^2 represents a hydroxyl group, or a nitrogen-containing heterocyclic group having 5 or 6 ring atoms[.],

R^3 represents a substituted or unsubstituted aryl group

R^4 represents hydrogen, a substituted or unsubstituted alkyl, aryl or dialkylamino alkyl group, a morpholinomethyl group or an N-pyrrolidinyl methyl group, provided that at least one of the groups R^1 and R^2 is a heterocyclic group.

PLANT PATENTS

GRANTED JANUARY 31, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,184
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,072
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant known by the cultivar name Corona, as described and illustrated, and particularly characterized by its large plant size and vigorous, self-branching growth habit; dark pink to red-purple flower color; excellent keeping qualities of flowers thereby making cultivar excellent for indoor use; relatively large green leaves with mid-rib veination, and by its adaptability to various environments of use.

5,185
AFRICAN VIOLET PLANT

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Jun. 21, 1982, Ser. No. 390,633
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Guenevere, as described and illustrated, and particularly characterized by its profuse flowering, red-purple flower color, erect and relatively long peduncles which elevate the profuse bouquet above the medium-size and symmetrical foliage, and by its 10–12 weeks flowering time.

5,186
MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,561
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

5,187
ASPARAGUS PLANT

J. Howard Ellison, Milltown, N.J., assignor to Research Corporation, New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,922
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of asparagus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of characteristics, rust resistance (to *Puccina asparagi*), good field tolerance to root rot (*Fusarium oxysporum*) and crown rot (*F. moniliforme*) together with its ability to produce edible spears and to be combined with a male plant to produce a hybrid having improved yield in addition to the foregoing.

PATENTS

GRANTED JAN. 31, 1984

ERRATA

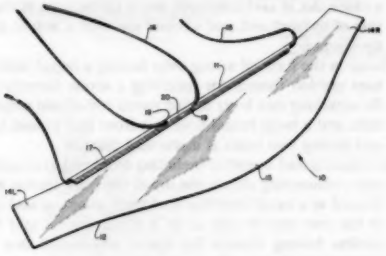
For CLASS	See PATENT NO.
604–077	4,428,373
502–077	4,428,862
502–008	4,428,863
502–151	4,428,864
502–077	4,428,865
548–491	4,428,881
424–248	4,428,883
381–099	4,429,181
381–055	4,429,182

PATENTS

GRANTED JANUARY 31, 1984

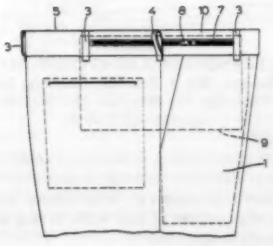
GENERAL AND MECHANICAL

4,428,079
PROTECTIVE TRANSPARENT FACE AND NECK SHIELD
Glenda D. McKee, 1610 Melrose Cir., Garland, Tex. 75042
Filed Apr. 18, 1983, Ser. No. 485,883
Int. Cl.³ A42B 1/18; A61F 9/00
U.S. Cl. 2—174 **12 Claims**



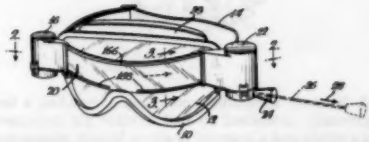
1. A protective transparent face and neck shield comprising: one transparent plastic piece having an enlarged central section proportioned to shield substantially a user's entire face from the forehead hairline down, and two side extensions positioned to wrap around neck sides below the ears and the back of the neck; tie strip means attached to the top of said transparent plastic piece including, a first tie strip attached to the top of said transparent plastic piece through a distance transversely substantially the same as the transverse extent of said enlarged central section with end extensions long enough to be tied at the back of a user's neck; and a second tie strip attached to the top of said transparent plastic piece through a transverse extent shorter than the fastening extent of said first tie strip with end extensions extended to be tied at the upper back of a user's head.

4,428,080
SLACKS
Noboru Takamatsu, Kaizuka City, Japan, assignor to Chikuma Apparel Co., Ltd., Japan
Filed Jul. 13, 1981, Ser. No. 282,745
Claims priority, application Japan, Jul. 23, 1980, 55-104899[U]
Int. Cl.³ A41D 1/06, 27/20; A41F 9/00
U.S. Cl. 2—227 **2 Claims**



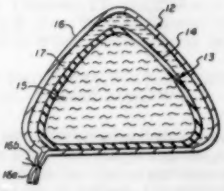
1. Slacks comprising one or more pockets and a plurality of belt loops attached to the slacks at the height of the waistband, wherein the pocket opening of at least one pocket is arranged in the waist band between two loops and an intermediate loop which is positioned between said two loops being sewn to the slacks only at the lower side whereby during the wearing of the slacks the pocket opening is covered by a belt passed through the belt loops.

4,428,081
GOGGLE WITH A RENEWABLE PROTECTIVE SURFACE
Robert E. Smith, c/o Smith Goggle, Box ii, Ketchum, Id. 83340
Filed Jul. 14, 1982, Ser. No. 398,379
Int. Cl.³ A61F 9/02
U.S. Cl. 2—438 **15 Claims**



1. Apparatus for providing a renewable surface for protecting the lens of a viewing device, comprising:
- a supply magazine for holding a transparent film adapted to protect a lens of a view device;
- a take-up magazine for receiving and holding spent film;
- means for mounting said magazines oppositely and in spaced relation adjacent a lens to be protected;
- advancing means for advancing film in said supply magazine across a lens to said take-up magazine; and
- a manual actuator for said advancing means movable between two positions, said manual actuator being constructed and arranged so that, upon every single movement of the actuator from one said position to the other, the film will advance across a lens a distance at least substantially equal to the spacing between said magazines.

4,428,082
BREAST PROSTHESIS WITH FILLING VALVE
Sadeque S. Naficy, 9343 North Loop East, Houston, Tex. 77029
Continuation-in-part of Ser. No. 214,449, Dec. 8, 1980, Pat. No. 4,298,998. This application Nov. 5, 1981, Ser. No. 318,582
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ A41C 3/10
U.S. Cl. 3—36 **17 Claims**



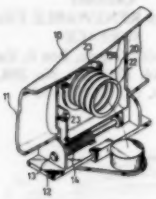
1. A breast prosthesis comprising
- an inner coherent core of biologically compatible, non-absorbable material,
- an outer container of a flexible absorbable material spaced from said core, and
- filling means on said outer container, of an absorbable material, for introduction of an inert liquid to fill the space between said outer container and said core.

4,428,083

AUTOMATIC LAVATORY SEAT

Po L. Chuang, No. 7, Lane 43, Min Chu Rd., Hsin Chu City, Taiwan

Filed Apr. 6, 1981, Ser. No. 251,577
Int. Cl.[3] A47K *13/12, 13/04*
U.S. Cl. 4—240 7 Claims



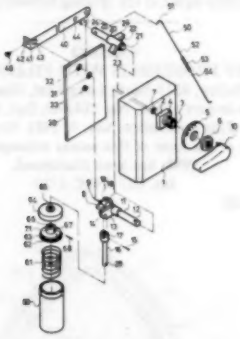
1. A lavatory apparatus comprising: a bracket; a lavatory seat pivotally connected to said bracket for movement between a raised and a lowered position; biasing means mounted on the bracket for urging said lavatory seat to said raised position; a plunger connected to said bracket; a flexible hose connected to the underside of said lavatory seat and positioned to receive said plunger to form an essentially fluid tight seal therewith when said seat is in said lowered position; and damping means connected in fluid communication with said hose for slowly admitting air therein when a load is removed from said lavatory seat.

4,428,084

WATER CONTROL DEVICE FOR FLUSH TOILET

Chong-Long Joun, 1st F., No. 28, Kuang-Fu Rd., Chungho 235, Taiwan

Filed Dec. 21, 1981, Ser. No. 332,512
Int. Cl.[3] E03D *5/02*
U.S. Cl. 4—407 7 Claims



1. A water control device for a flush toilet comprising:
a hollow box having a square base and a central thru hole therein for receiving an axle seat having threads;
a round calibration pad attached to said axle seat and fixed thereto with a nut, and a handle for being fitted over a main axle extending out thru said axle seat, and a thru hole located at the upper left of said square base;
a main axle having a notch stud at a front end thereof, received in said box and extending out thru said central hole, and having a small coupling hole and having a round sliding cam at a right side thereof and also having a catch flange and a catch piece at the left side thereof and a round salient piece at a rear tip thereof;
a box bottom of rectangular thin piece having two round holes therein and a small salient block, and able to be tightly connected with said box, the round salient piece at the rear tip of the catch piece fitting into one of said holes;
a handle attached to said main axle for rotating said main axle by a user;
a connecting rod, coupled to said main axle with a pin passed through said connecting rod and said coupling hole in said main axle, arranged to move in response to rotation of said main axle;
an actuating axle having a round salient piece at a front end able to fit into the thru hole of said box, and a supporting piece, at the right side of a front end thereof, and having a catch slot at said front end, and a catch piece at the left side of its front end, and a round rod with a hole at a rear tip thereof;
a lever in the form of a long strip having a round hold in a bent portion thereof for receiving a screw therethrough for attaching said lever to said round rod of said actuating axle, and a large round hole at a front end of said lever, and having two holes at a rear end thereof;
an actuating rod assembly including front and rear sections and a connecting sleeve, the top of the front section being formed as a catch hook for hooking into one of said holes at the rear end of said lever, a lower end of said front section having threads for screw attachment into said connecting sleeve, the front and rear sections having threads for screwing into said connecting sleeve, a lower end of said rear section being formed into a hook;
a hydraulic control assembly including a hollow hydraulic cylinder having a ring flange on an inner wall surface thereof, a spring, a round salient piston having an oil seal and having a central hole thru said round salient piece and a steel ball fitted in said round hole, and on a side of said piston, hole and an oil outlet, and a vertical oil inlet, and a rubber aid at a top of said hydraulic cylinder said spring for biasing said piston, said hydraulic assembly being actuated to move said piston against the bias of said spring by said connecting rod, attached thereto through said central hole, for controlling the time of a flush as a function of the degree of rotation of said main axle, the returning of the piston to its biased position causing the flush to end.

4,428,085

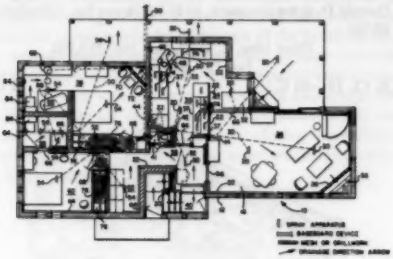
SELF-CLEANING BUILDING CONSTRUCTION

Frances G. Bateson, Rte. 5, Box 695, Newburg, Oreg. 97123

Filed Apr. 21, 1980, Ser. No. 142,558
Int. Cl.[3] A47K *4/00*
U.S. Cl. 4—662 14 Claims

1. A self-cleaning building construction comprising:
walls, ceiling and a floor defining an enclosure wherein said floor slopes with respect to the horizontal toward a drain and wherein surfaces of said walls, ceiling and floor are substantially waterproof,
water distribution means located proximate the ceiling and adapted to deliver a spray of water or mist to the interior of said enclosure for cleaning said surfaces and exiting along said sloping floor into said drain,
and baseboard means in said enclosure, said baseboard means comprising an elongated structure including a feeder chamber, means for providing water to said feeder cham-

ber, and a forward dispensing chamber receiving water from said feeder chamber and having a forward slot adja-



cent said floor for distributing water therethrough along an edge of said floor and toward said drain.

4,428,086

BED SUPPORT SIDE RAIL MEMBER

George M. Harris, 505 N. Lake Shore Dr., Chicago, Ill. 60611

Filed Nov. 2, 1981, Ser. No. 317,170
Int. Cl.³ A47C *19/00*
U.S. Cl. 5—200 C 6 Claims

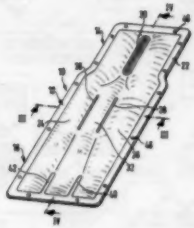
1. A side rail member for supporting bed means in spaced relationship to a floor, comprising a pair of elongated side rail sections of generally L-shaped cross section positioned in end to end relationship, said rail sections having vertical leg portions and horizontal leg portions, said vertical leg portions and horizontal leg portions of each of said side rail sections having outwardly offset portions at their adjacent ends, a generally L-shaped connecting bracket having a vertical leg portion and a horizontal leg portion received within said offset portions of said side rail sections, said outward offset portions having a depth which is substantially equal to the thickness of the vertical and horizontal leg portions of said connecting bracket, and fastening means for securing said connecting bracket to said pair of side rail sections.

4,428,087

THERAPEUTICAL AIR MATTRESS

Friedrich Horn, Ludwigstrasse 7, 8950 Kaufbeuren, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,484
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039956
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—449 5 Claims



1. A therapeutical air mattress comprising: a pair of substantially rectangular oblong resilient walls connected with one another to define a pair of inflatable side chambers; a head part of said mattress in which said pair of side chambers are arranged with only a small interspace therebetween; a leg part; a body part of said mattress intermediate of and adjoining the head part and the leg part; the side chambers being spaced from one another in the body part by an oblong compartment provided between the side chambers which comprises a large interspace than the interspace in the head part; an oblong resiliently deformable body arranged within said oblong compartment and having a greater deformation resistance than the pair of side chambers, the deformable body being displaceably arranged within the compartment in the longitudinal direction of the mattress; and an opening extending through the walls provided in the longitudinal direction of the mattress between the side chambers in the head part of the mattress.

4,428,088

AUTOMATIC LIQUID LEVEL CONTROL FOR AUTOMATIC WASHERS

Edward H. Getz, Pipestone Township, Berrien County, and Clarence R. Ott, Jr., Lake Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 11, 1981, Ser. No. 272,677
Int. Cl.³ D06F *33/02, 39/08*
U.S. Cl. 8—158 7 Claims

1. A method of automatically charging optimum amounts of liquid in a liquid treatment machine comprising:

(1) placing materials to be treated in a container in the machine;

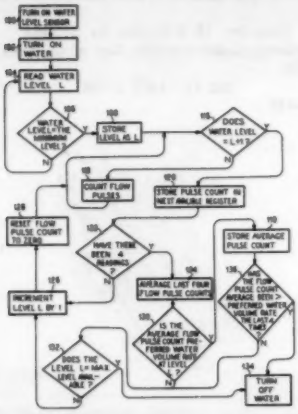
(2) filling the container to a predetermined minimum level;

(3) measuring the incremental volume of liquid required to increase the liquid level in the container by a specific depth increment;

(4) comparing the measured incremental volume with a predetermined incremental volume for that particular level in the container;

(5) continuing the introduction, measuring and comparison

of the incremental liquid volume until the measured volume is greater than the predetermined volume; and


TURN ON WATER LEVEL SENSOR
TURN ON WATER
READ WATER LEVEL L
WATER LEVEL > THE MINIMUM LEVEL?
STORE LEVEL AS L
DOES WATER LEVEL = L +/- ?
COUNT FLOW PULSES
STORE PULSE COUNT IN NEXT AVAILABLE REGISTER
RESET FLOW PULSE COUNT TO ZERO
HAVE THERE BEEN 4 READINGS ?
STORE AVERAGE PULSE COUNT
INCREMENT LEVEL L BY 1
AVERAGE LAST FOUR FLOW PULSE COUNTS
IS THE AVERAGE FLOW PULSE COUNT PREFERRED WATER VOLUME RATE AT LEVEL L +/- ?
DOES THE LEVEL L = MAX LEVEL AND = ABLE ?
TURN OFF WATER

(6) terminating the introduction of liquid into said container after said measured volume is greater than the predetermined volume.

4,428,089

FOOTWEAR AND FORMING METHODS THEREFOR

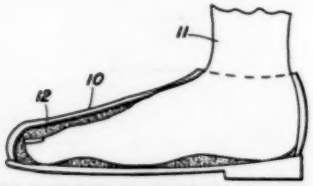
Stanley R. K. Dawber, The Spinney, 1 Copperfield Rd., Cheadle Hulme, Cheshire, and Duncan J. Fraser, 52 Westgate, Hale, Cheshire, both of England

Continuation of Ser. No. 43,891, May 30, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,604

Claims priority, application United Kingdom, May 31, 1978, 25887/78

Int. Cl.³ A43D *9/00*; A43B *7/14*

U.S. Cl. 12—142 R **3 Claims**



1. A method of forming an everyday article of footwear to fit an individual user's foot, which method comprises employing as said article one in which said foot is readily engageable, engaging said foot in said article, filling the free space between said foot and said article with fluent material, removing said foot from said article, removing said material from said article and measuring the former to determine the volume of said free space, covering said foot with a close-fitting first sock of impermeable release material, covering said foot and said first sock with a close-fitting second sock of resilient textile material, engaging the double sock covered foot in said article, and forming a moulding in said free space by dispensing thereinto a self-gassing expansible liquid which rapidly cures to a permeable open-cell foamed resilient solid, which is in a quantity determined to produce said solid substantially to equal said free space volume, which spontaneously bonds to said article, and which impregnates said second sock to be reinforced thereby but does not bond to said first sock.

4,428,090

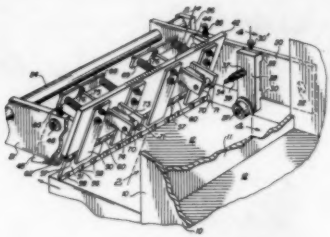
PALLET SCRAPER

Michael E. Coggin, 1524 South Price #101, Tempe, Ariz. 85281; Charles K. Everett, 1221 W. 6th Dr., Mesa, Ariz. 85201, and Donald D. Schwellenbach, 4520 W. Bryce La., Glendale, Ariz. 85301

Filed Mar. 2, 1982, Ser. No. 353,901

Int. Cl.³ B08B *1/02*

U.S. Cl. 15—93 C **12 Claims**



1. A device for cleaning pallets as the pallets are moved from one location to another, said device including in combination:

a frame mounted in a fixed location relative to the path of travel of pallets to be cleaned;

a pivot means;

blade holder means pivotally attached to said frame through said pivot means for limited rotational movement relative thereto;

a pallet scraper blade mounted in said blade holder means in a scraping position near the surface of a pallet to be cleaned; and

spring means for yieldably mounting said blade holder means and said scraper blade to permit rotation thereby about said pivot means against said spring means in response to a first force perpendicular to the pallet surface and in response to a second force in a plane parallel to the pallet surface in the direction of movement of a pallet past said scraper blade, the axis of said pivot means being a predetermined distance above and in front of the line of contact of said pallet scraper blade in the normal direction of movement of pallets past said device during the cleaning operation.

4,428,091

TOOTHBRUSH

Thomas B. Janssen, 153 Waverly Pl., New York, N.Y. 10014

Filed Dec. 14, 1981, Ser. No. 330,168

Int. Cl.³ A46B *13/08*

U.S. Cl. 15—167 A **17 Claims**

1. In a tooth brushing device of the type including a handle portion, and a brushing head mounted on said handle, the improvement in said brushing head characterized by

(a) said head being in the form of a body of revolution and including soft, resilient inner and outer flange-forming members and a soft, resilient impact cushion located between said flange-forming members,

(b) relatively non-resilient lens-like displacement wafers between said impact cushion and flange-forming members for effecting axially outward displacement of the flange-

forming members upon radial compression of said impact cushion, and

(c) annular restraining means positioned outside of said flange-forming members and engaging said members in annular areas spaced from the axis of the brushing head,

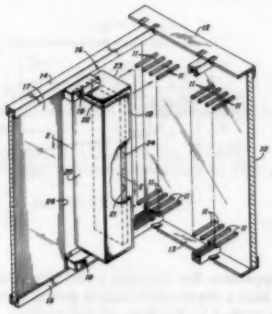
(d) said displacement wafers and said annular restraining means being so related that, upon outward axial displacement of said wafers, central portions of said flange-forming members are displaced outward relative to said annular restraining means, causing a closing movement of portions of said flange-forming members radially outward of said restraining means.

4,428,092

ELECTRICAL TERMINAL PIN CONDITIONING APPARATUS

Dominic T. Lipari, Franklin, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 1, 1982, Ser. No. 353,082
Int. Cl.³ B08B *1/00*
U.S. Cl. 15—246 **10 Claims**



1. Apparatus for conditioning the pins of a terminal pin array of an electrical backplane comprising a block having an array of apertures corresponding to said pin array, said block further having a slot formed at substantially right angles to the axes of said apertures, and an absorbent element fitted in said slot, said absorbent element being saturated by a fluid and being pierceable by said pins of said pin array.

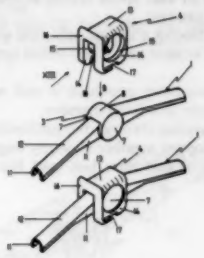
4,428,093

SPACER FOR PIVOTALLY CONNECTING WIPER BLADE PARTS

Phillippe Denis, Glabais, Belgium, assignor to Champion Spark Plug Europe S.A., Binche, Belgium

Filed Jan. 8, 1982, Ser. No. 337,964
Claims priority, application France, Jan. 9, 1981, 81 00269
Int. Cl.³ B60S *1/04*
U.S. Cl. 15—250.42 **9 Claims**

1. A connecting device for pivotally connecting two yokes of a wiper blade, characterized in that said connecting device is comprised of two separate parts, the first part of said two parts being secured to the first of the two yokes, the second of said two parts being secured to the second of the two yokes and means on said first part rotatably engaging with mating



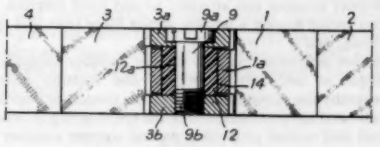
means on the second part for pivotally connecting the two yokes together.

4,428,094

HINGE ELEMENTS FOR SPECTACLES COMPRISING A FRICTION RING

Jean Emain, Saint Claude, France, assignor to S.A. Vve Henry Chevassus, Morez, France

Filed Oct. 20, 1981, Ser. No. 313,317
Claims priority, application France, Oct. 28, 1980, 80 23029
Int. Cl.³ G02C *5/22*
U.S. Cl. 16—228 **18 Claims**



1. A hinge for use with spectacles comprising a female mortise element having two arms defining opposite inner faces, a male tenon element engaged between the opposed inner faces of said two arms, and a third element constituted by a hinge pin for connecting said female mortise element and male tenon element, wherein one of the first two elements of the hinge is formed with a cylindrical bore in which is disposed a removable compressible friction ring made of semi-elastic plastics material for accepting said hinge pin when said hinge pin is positioned to connect said female mortise element and male tenon elements, and for exerting an axially directed braking force acting on the two opposite inner faces of the arms of the female mortise element, said friction ring, in the stressed state, presenting between its two opposite faces, a height approximately equal to the thickness of the bore within which it is disposed.

4,428,095

SAFETY DEVICE OF A HINGE

Jun Takahashi, Aikawamachi, Japan, assignor to N H K Spring Co., Ltd., Yokohama, Japan

Filed Jul. 28, 1981, Ser. No. 287,803
Claims priority, application Japan, Jul. 31, 1980, 55-105386
Int. Cl.³ E05F *1/12*
U.S. Cl. 16—297 **1 Claim**

1. A hinge device comprising:

a rotatably moveable rotation member supported by a core bar;

a spiral spring with an inner and an outer end connected to said rotation member;

a safety device, said safety device comprising

a first split groove on an outer end of said core bar;

a second split groove on an end of said core bar, opposite to that of said first split groove;

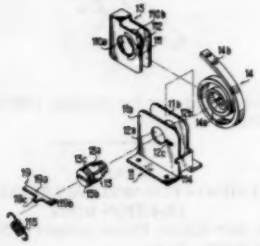
said inner end of said spiral spring is located within said second split groove;

a first groove having a detent, said first groove being provided in and located near a perforated hole in said rotation member,

a second groove being provided in and which opens to a perforated hole in a fixed member;

said core bar passing through the perforated holes;

an L-shaped stopper member slidingly engaged in said first split groove of said core bar, said first groove of said



rotation member and said second groove of said fixed member;

a tension coil spring attached to a first projection on said stopper member and attached to said fixed member, said coil spring having a weaker spring force than said spiral spring; and

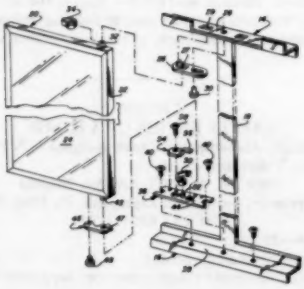
a second projection on said stopper member slidingly engaged in said first groove of said rotation member, whereby the tensioning force of the tension coil spring is activated upon malfunction of the spiral spring in order to pull said second projection on said stopper member into said detent of said first groove of said rotation member, preventing further rotation of said rotation member.

4,428,096

HOLD-OPEN MECHANISM FOR REFRIGERATED DISPLAY CABINET HAVING COOPERATING SPRING AND LOBED PLATE

Melvin C. Kaspar, La Grange Park, Ill., assignor to Ardco, Inc., Chicago, Ill.

Filed Sep. 28, 1981, Ser. No. 306,145
Int. Cl.³ E05D *11/10*
U.S. Cl. 16—335 **8 Claims**



1. A door hold-open mechanism for a door hingedly mounted to a door frame for swinging movement between closed and opened positions, said mechanism comprising:

plate means affixed to said door and movable therewith and having first and second shoulders, and

spring means mounted on said frame adapted to engage with said plate means when said door is in said opened position and adapted to disengage said plate means when said door is moved from said opened position, whereby said door is adapted to be releasably maintained in said opened position,

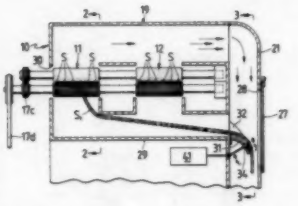
said spring means comprising a spring including a first end portion mounted on said frame, a second free end portion adapted to releasably engage said first shoulder on said plate means, and an intermediate portion spaced from said second end portion and abutting said second shoulder on said plate means when said door is moved from said opened position toward said closed position to displace said spring means and thereby urge said second end portion out of engagement with said first shoulder on said plate means.

4,428,097

PROCESS AND APPARATUS FOR STOPPING DRAW FRAMES AND THE LIKE

Fletcher D. Adamson, Alexander City, Ala., assignor to Russell Corporation, Alexander City, Ala.

Filed Feb. 28, 1983, Ser. No. 470,771
Int. Cl.³ D01C *31/00*
U.S. Cl. 19—0.25 **5 Claims**



1. In apparatus for stopping a roll-type draw frame of the kind in which a sliver when broken moves away from the path of slivers drafted by the rolls of the machine,

(a) means to move broken slivers from all the rolls along a common, converging path, whereby all broken slivers from all the rolls pass by substantially the same location in the apparatus,

(b) a sensor having a field of influence located immediately adjacent the common converging path of said broken slivers and effective to generate a signal in response to the presence of said broken slivers in said field, and

(c) means to utilize such signal to stop the drafting action of the frame.

4,428,098

BAG CLAMP

Terry Coker, 11737 Washington, Apt. 1403, Northglenn, Colo. 80234, and Stanley W. Coker, 8954 Lander St., Westminster, Colo. 80030

Filed Jul. 16, 1981, Ser. No. 283,897
Int. Cl.³ B65D *77/10*; A44B *21/00*
U.S. Cl. 24—30.5 R **12 Claims**

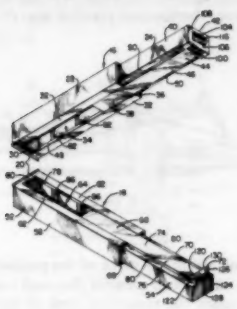
1. A closure device for bags and the like, comprising:

a first jaw element defined by a first outer telescoping member having an open interior and a first inner telescoping member axially movable therein;

a second jaw element defined by a second outer telescoping member having an open interior and a second inner telescoping member axially movable therein, said first and second jaw elements pivotally connected to one another and movable between an open position and a closed posi-

tion abutting one another for clamping a bag therebetween;

means secured to said first and second jaw elements for releasably clasping said first and second jaw elements in the closed position;



means secured to each of said first and second jaw elements for releasably retaining each said inner telescoping member in one of a plurality of discrete axial positions with respect to its respective outer telescoping member.

4,428,099

TENSIONING APPARATUS

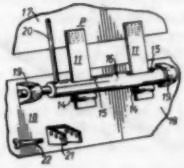
Raymond Richmond, 1a, Barley Hill La., Garforth, Leeds, England LS25 1DX

Filed Nov. 2, 1981, Ser. No. 317,368

Claims priority, application United Kingdom, Oct. 17, 1980, 8033520

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—68 CD **10 Claims**



1. A tensioning apparatus for tensioning a flexible member anchored at one end comprising, in combination, a rotary member arranged for rotation about an axis parallel to the intended plane of tension for the flexible member and at right angles to the intended direction of tensioning, manually operable means for rotating said rotary member to wind said flexible member onto said rotary member to tension said flexible member, locking means for locking said rotary member with the flexible member under tension, a slot of uniform length and width dimensions through said rotary member extending and a rigid element no longer than the length of the slot secured to the flexible member to be tensioned and, wherein, the slot has such width as to allow the free end of the flexible member to be entered thereinto and drawn through the rotary member until the rigid element lies within said slot, and said rigid element has such length, in the direction of its insertion into the slot, and the slot has such depth, that the rigid element is locked in the slot when the plane of the slot is rotated through more than 90° from the intended plane of tension for the flexible member and the said flexible member is in tension.

4,428,100

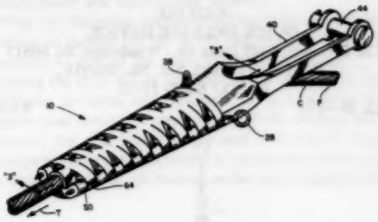
FLIP TOP AUTOMATIC DEADEND

Kenneth P. Apperson, Pinson, Ala., assignor to Square D Company, Palatine, Ill.

Filed Apr. 16, 1982, Ser. No. 369,053

Int. Cl.³ F16G *11/00*

U.S. Cl. 24—115 R **14 Claims**



1. A gripping device for a conductor comprising a main body having means for connecting said gripping device to a support, said main body having lateral edges and an arcuate elongated recess therein said recess having a tapering cross-section; a cover having an elongated arcuate recess, said recess having a corresponding tapering cross-section; releasable means for releasably retaining said cover on said main body with said recesses cooperating to define an elongated opening through the length of said device and open at two ends of said device, said opening having a tapering, circular cross-section, such that one end cross-section has a diameter greater than the other end cross-section, gripping means supported in said opening having means for biasing said gripping means towards the other end cross-section and means for releasably retaining said gripping means in a first position adjacent the one end cross-section.

4,428,101

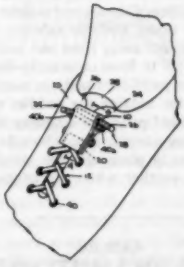
FASTENING DEVICE

Dianne Harkavy, 39 S. Ashby Dr., Livingston, N.J. 07039

Filed Oct. 1, 1981, Ser. No. 307,529

Int. Cl.³ F16G *11/10*

U.S. Cl. 24—117 **17 Claims**



1. A fastening device for a lace-up article comprising:

(a) a gripper having first and second patches of a first type of fastener material, said patches being moveable with respect to one another between a closed position in which said patches confront one another and an open position in which said patches are remote from one another; and

(b) a lace having two oppositely-directed faces, said lace having four areas of a second type of fastener material complementary to the fastener material of said first type, two of said areas being disposed on each of said faces, the two areas on each face being disposed adjacent opposite

ends of the face so that two of said areas, including one on each of said faces, are disposed adjacent each end of the lace, the fastener material of said patches being engageable with the fastener material of said areas when said lace is engaged with the article and said patches are in said closed position with said areas of said lace disposed therebetween.

4,428,102

QUICK RELEASE DEVICE

David B. Brownell, 6407 Dean Dr., Woodridge, Ill. 60517

Filed Apr. 9, 1982, Ser. No. 366,911

Int. Cl.³ B64D *17/32*

U.S. Cl. 24—574 **8 Claims**

1. A quick release device comprising two members which may be releasably engaged to transmit a tensile force, each of the members having a load-connection end and an engagement end, the engagement end of each of the members comprising two flat, flexible elongated branches, the branches of each member originating in aligned, face-to-face relationship with each of the branches terminating in a flat, rigid paddle, the paddles of one member being foldable relative to the adjacent portions of their branches toward one another through an arc of substantially 180° to form inwardly-directed U-shaped pockets to receive the paddles of the second member, the paddles of the second member being foldable relative to the adjacent portions of their branches away from one another through an arc of substantially 180° to form outwardly-directed U-shaped pockets to receive the paddles of said one member, and releasable latching means for holding the paddles securely in their substantially 180° folded positions whereby the members are capable of transmitting a tensile force therethrough so long as the latching means is in place and the members will freely disengage from one another when the latching means is released.

4,428,103

LOCK FOR A SAFETY BELT

Franz Wier, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

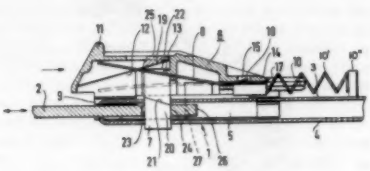
Filed Feb. 3, 1981, Ser. No. 231,012

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004169

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—654 **7 Claims**

1. Lock for a safety belt comprising a belt lock having a metallic support with two spaced plates defining an insertion path, an insertion tab attached to a belt end for insertion in the insertion path of the metallic support, a latching bolt movable transversely to the insertion path to a blocked position in which the bolt is interposed in the path of said tab and to an open position in which the bolt does not block passage of the tab in the insertion path, spring means urging the latching bolt to the blocked position, a pushbutton mounted on the metallic support movable against the force of a spring to move the latching bolt from the blocked position into the open position



a detent element which is a piece of the pushbutton and movable therewith, said detent element disposed outside the insertion path and inside the transverse path of the latching bolt, preventing transverse movement of the latching bolt, and said detent element movable out of the transverse path of the latching bolt by movement of the pushbutton and, wherein the detent element is disposed in the transverse path of the latching bolt to detent the latching bolt in the open position.

4,428,104

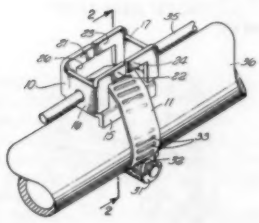
GROUND CLAMP

Donald J. Smith, Woodland Hills, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Mar. 9, 1982, Ser. No. 356,426

Int. Cl.³ F16L *3/00*

U.S. Cl. 24—279 **4 Claims**



1. A ground clamp of a single unitary piece of metal for making an electrical and mechanical connection between a wire and a metal pipe with a pipe band as the sole fastener,

comprising a metal saddle having a central plate, opposed down turned sides defining a pipe engaging channel having a first longitudinal axis, and opposed up turned ends with generally aligned openings for receiving a wire,

with the inner edges of said down turned sides having sharp corners, and with the lower edges of said openings spaced upward from said plate, and with said openings defining a second axis substantially parallel with said first axis,

with at least one of said up turned ends including at least one finger projecting toward the other of said ends defining a band space between said plate and at least one finger for receiving and retaining a pipe band

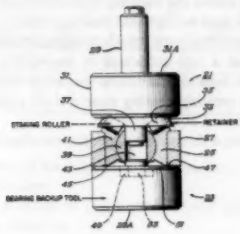
so that a single pipe band positioned about a pipe and a wire with said saddle therebetween with the pipe at said pipe engaging channel and the wire in said aligned openings, urges the pipe and wire toward each other deforming the wire between said aligned openings thereby grounding said wire to said pipe.

4,428,105

BEARING STAKING TOOL AND METHOD

Johnnie G. Abbott, Burleson, and Ralph V. Brown, Fort Worth, both of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Jan. 4, 1982, Ser. No. 336,932
Int. Cl.³ B21D 53/10
U.S. Cl. 29—149.5 B 4 Claims



1. A bearing staking tool for staking a bearing to a housing, comprising:

a C-shaped member comprising a main body portion having first and second aligned end members spaced from each other and extending generally transverse from said main body portion,

first and second aligned apertures formed through said first and second end members respectfully,

said first aperture being threaded and said second aperture having a smooth inner surface,

a threaded rod extending through said first aperture and having threads which mate with the threads formed in said first aperture,

a swivel means secured to the end of said threaded rod between said first and second end members,

a roller staker comprising staking rollers at one end and a spindle at an opposite end,

said spindle being adapted to be located in said second aperture with said staking roliers located between said first and second end members and facing said swivel means,

said spindle when located in said second aperture having an end portion extending through said second aperture whereby it may be gripped by a drill means and rotated for rotating said staking rollers, and

means for allowing said threaded rod to be rotated in one direction to locate said swivel means from said staking rollers sufficient to receive a bearing and its housing there between and to be rotated in an opposite direction for applying force by said swivel means and said staking rollers to opposite ends of the bearing and housing whereby the bearing may be staked to the housing by gripping said end portion of said spindle with a drill means and rotating said spindle and said staking rollers while axial force is applied by said swivel means and said staking rollers to opposite ends of the bearing and housing independent of the drill means.

4. A method of swaging an annular lip of a bearing to a surrounding housing by employing a C-shaped member comprising a main body portion having first and second aligned end members spaced from each other and extending generally transverse from said main body portion, first and second aligned apertures formed through said first and second members respectfully, said first aperture being threaded and said second aperture having a smooth inner surface, a threaded rod extending through said first aperture and having threads which mate with the threads formed in said first aperture, swivel means secured to the end of said threaded rod between said first and second end means, a roller staker comprising staing rollers at one end and a spindle at an opposite end, said spindle being adapted to be located in said second aperture with said staking rollers located between said first and second end members and facing said swivel means, said spindle when located in said second aperture having an end portion extending through said second aperture whereby it may be gripped by a drill means and rotated for rotating said staking rollers, said method comprising the steps of:

seating a backup member against said swivel means,

locating a bearing and a surrounding housing between said roller staker and said backup member,

rotating said threaded rod in a direction to cause said staking rollers to engage the lip of the bearing and said backup member to engage the other end of the housing,

operating the drill means to rotate said roller staker, and

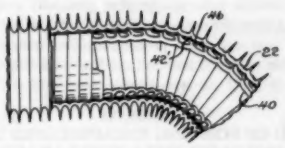
continuing to rotate said threaded rod in said direction to apply axial force to opposite ends of the bearing and the housing by said roller staker and said swivel member independent of the drill means to cause said staking rollers to swage the lip of the bearing to the surrounding housing.

4,428,106

METHOD OF MAKING DOUBLE WALL TUBING ASSEMBLY

Bonnie J. Campbell; Thomas G. Counts; James L. Cunningham, and Karl J. Youtsey, all of Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 930,942, Aug. 4, 1978, Pat. No. 4,343,360.
This application Apr. 26, 1982, Ser. No. 371,919
Int. Cl.³ B21D 53/00
U.S. Cl. 29—157.3 A 3 Claims



1. A method of making a double wall heat exchange tube coil with a between wall channel which can receive and carry leakage flow resulting from a failure in either wall comprising the steps of externally finning a first tube over at least a portion of its length to produce a plurality of closely spaced transverse fins and simultaneously producing a turbulence inducing configuration in its inner wall; externally finning a second tube having a larger diameter than the first tube over at least a portion of its length; bending the tips of the fins on the first tube so they are directed generally axially of the tube and are spaced from the wall of the tube so as to define a generally enclosed space having the tube wall at its base, the bent over fin tip at its top and the radially extending walls of two adjacent fins at its sides; inserting the first tube within the second tube so that a finned portion of the second tube will closely overlie a finned portion of the first tube; and forming the composite assembly of tubes into a coil over at least a portion of its length, thereby forcing the inner wall of the second tube into tight mechanical engagement with the bent over fin tips of the first tube.

4,428,107
PROCESS FOR FILLING WITH A HARDENABLE FILLER GAPS WHERE CORROSIVE ATTACK CAN OCCUR IN TUBE AND FIN HEAT EXCHANGERS

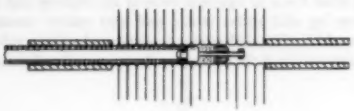
Karl Mack, Singen, Fed. Rep. of Germany, and Zdenek Maly, Kreuzlingen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 115,088, Jan. 24, 1980, Pat. No. 4,342,150. This application Mar. 31, 1982, Ser. No. 363,893

Claims priority, application Switzerland, Feb. 1, 1979, 1001/79

Int. Cl.³ B21D *53/00*; **B21K** *29/00*; **B23P** *15/26*; **B05D** *7/22*

U.S. Cl. 29—157.3 A **7 Claims**



1. A process for filling the ring-shaped gaps formed between the tubes and fins of a tube and fin type heat exchanger with a corrosion protective filler material comprising:

(a) stacking said fins such that the collars of said fins form a first substantially cylindrical passage along a first axis;

(b) matingly positioning a first hollow cylindrical body having a second cylindrical passage substantially equal in diameter to said first cylindrical passage along said first axis on one side of said stacked fins so as to form an extension of said first cylindrical passage;

(c) sealingly locating a body having a variable volume chamber within said second cylindrical passage in said first hollow body;

(d) charging said variable volume chamber with said corrosion protective filler material;

(e) positioning a heat exchanger tube upstream of said body having said variable volume chamber and proximate thereto; and

(f) pushing said heat exchanger tube against said body and into said first substantially cylindrical passage whereby said variable volume chamber gradually contacts as said body passes through said first cylindrical passage so as to force said corrosion protective filler material from said variable volume chamber and into said ring-shaped gaps.

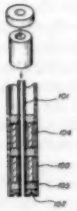
4,428,108
METHOD OF FORMING ENCAPSULATED DEPLETED URANIUM OIL FIELD TUBULAR MEMBER

Elick H. Acree, Alvin, and Walter P. Peeples, Jr., Houston, both of Tex., assignors to Gulf Nuclear, Inc., Webster, Tex.

Filed Oct. 5, 1981, Ser. No. 308,580

Int. Cl.³ B21D *39/00*; **B23P** *19/04*

U.S. Cl. 29—455 R **2 Claims**



1. Method of forming an encapsulated uranium oilfield tubular member, comprising the steps of:

assembling concentric spaced tubes and closing one end of said tubes to form a tubular shell having an open end along the longitudinal axis thereof;

filling said tubular shell with discrete bodies of uranium and lead;

positioning said tubular shell such that said closed end is below said open end;

forming a heating zone around a portion of the length of said shell adjacent said closed end, the temperature within said zone being above the melting temperature of lead, thereby to melt the lead within said heating zone;

moving said heating zone axially along said shell toward said open end at a rate sufficient to maintain a substantially continuous area of transition between the melted lead within said moving heating zone and the cooling solidified lead below said zone;

and connecting a threaded connector member to each end of the shell.

4,428,109
LATHE

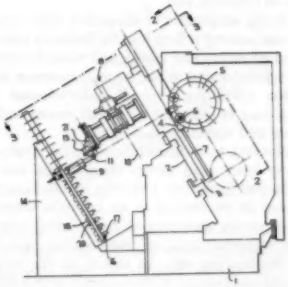
Friedrich Seeger, Wissmar, Fed. Rep. of Germany, assignor to Heyligenstaedt & Co. Werkzeugmaschinenfabrik GmbH, Giessen, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 270,148

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023539

Int. Cl.³ B23Q *3/155*

U.S. Cl. 29—568 **6 Claims**



1. A lathe having a longitudinal slide, a longitudinal guide for said slide, a cross guide carrying a faceplate on said slide, a tool turret mounted on said faceplate, a tool magazine and an automatic tool changer,

(a) said tool changer being arranged on said longitudinal slide,

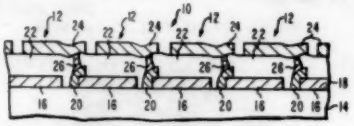
(b) said tool magazine having a plurality of ledges arranged transverse to the longitudinal guide and a plurality of tool storage holders arranged on said ledges at right angles to said longitudinal guide and in adjacent rows along said longitudinal guide, and

(c) said tool magazine being arranged parallel to the cross guide, and the ledges being provided with latching means adapted to be unlatched by said tool changer, said tool changer having means for shifting the ledges from one latched position to another.

4,428,110
METHOD OF MAKING AN ARRAY OF SERIES CONNECTED SOLAR CELLS ON A SINGLE SUBSTRATE

Jin K. Kim, Columbia, Md., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1981, Ser. No. 306,712
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 6 Claims



1. In a method of forming an array of series connected solar cells which includes;

(a) forming a series of conductive lower electrodes on an insulating substrate;

(b) forming a semiconductor layer on the surface of said conductive lower electrodes and said substrate; and

(c) applying a series of conductive upper electrodes over the surface of said semiconductor layer;

the improvement comprising forming an electrical connection between the upper electrode of one cell and the lower electrode for the next adjacent cell by spiking an inter-electrode connection completely through the semiconductor layer, said spiked inter-electrode connection resulting from the spiking of metal stripes applied over said lower electrodes.

4,428,111
MICROWAVE TRANSISTOR

Robert G. Swartz, Highlands, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1981, Ser. No. 327,790
Int. Cl.³ H01L *21/203, 21/302*
U.S. Cl. 29—576 E 3 Claims

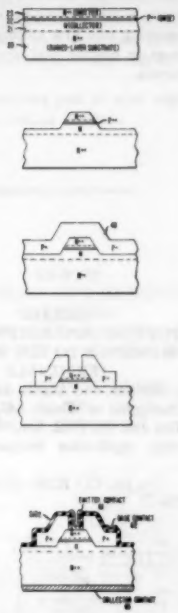
1. A process for fabricating a high speed bipolar transistor comprising the steps of

growing collector, base and emitter layers on a semiconductor substrate using molecular beam epitaxy, the substrate having a conductivity similar to the collector layer,

etching the grown layers to isolate regions of emitter and base layers,

growing a contact layer over the etched surface with the same conductivity as said base layer using molecular beam epitaxy,

selectively etching said contact layer to expose the emitter-base layer and isolate emitter base regions, and

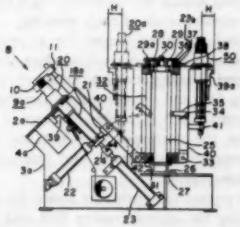


depositing metal on the exposed emitter layer, a portion of said contact layer, and on said substrate to fabricate emitter, base and collector contacts, respectively.

4,428,112
COIL INSERTER

Takatoshi Hattori, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,194
Claims priority, application Japan, Sep. 29, 1980, 55-135640
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—734 8 Claims



1. A coil inserter for an iron core having a plurality of slots formed therein comprising:

a plurality of tooling devices for inserting a coil and a plurality of wedges into each of said plurality of slots in said iron core;

actuator means for driving said tooling devices and which is detachably connected to said tooling devices;

a tool stocker having a shaft connected thereto for selec-

tively movably receiving a first tooling device said tooling devices depending upon the shape of said iron core; and

a tooling device supporter having one end supported by said shaft connected to said tool stocker for moving a second tooling device of said tooling devices to said tool stocker and for removing said first tooling device from said tool stocker so as to engage said tooling devices with said actuator means.

4,428,113
APPARATUS FOR CONNECTING THE ENDS OF STATOR WINDINGS TO THE STATOR SUPPLY TERMINALS

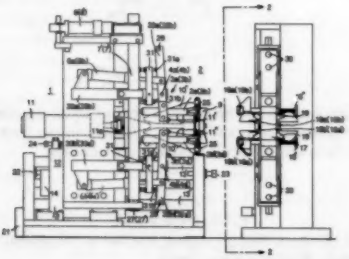
Bruno Fischer, Dietikon, and Angelo Andretta, Urdorf, both of Switzerland, assignors to Micafil AG, Zurich, Switzerland

Filed Jan. 20, 1982, Ser. No. 341,140

Claims priority, application Switzerland, Jan. 29, 1981, 571/81

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—736 **6 Claims**



1. Apparatus for connecting the first and second ends of at least one winding of a wound electrical stator to corresponding first and second stator supply terminals, respectively, said apparatus comprising:

stator holding means having means for holding the first and second winding ends of each winding;

insertion and clamping means for gripping the first and second winding ends of each winding, displacing the first and second winding ends into engagement with the corresponding first and second supply terminals, respectively, and clamping each of the first and second supply terminals to secure the corresponding first and second winding ends, respectively, thereto, said insertion and clamping means comprising:

first and second tong gripping means for each winding for gripping the corresponding first and second winding ends, respectively, and fluid actuated piston means for actuating each of said first and second tong gripping means,

first and second positioning means pivotable with respect to respective vertical axes for laterally displacing said first and second tong gripping means, respectively, with respect to said stator holding means; and

clamping tool means for each winding for clamping the corresponding first and second supply terminals.

4,428,114
MODULAR HARNESS MAKING METHOD AND APPARATUS

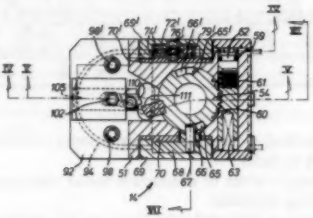
Vladimiro Teagno, Turin, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 5, 1981, Ser. No. 308,623

Claims priority, application United Kingdom, Oct. 7, 1980, 8032283

Int. Cl.³ H01R *43/00*; B23P *23/00*; B21F *3/00*

U.S. Cl. 29—857 **15 Claims**



1. A method of making a modular electrical harness comprising a plurality of wires terminated at respective opposite ends in respective terminals of rows of terminals in a pair of electrical connector parts, which method comprises the steps of feeding first and second connector parts of each pair aligned in end-to-end relation to first and second spaced terminating stations of an operating zone, terminating a leading end of a wire extending from a wire supply in a preselected terminal of the first connector part at the first terminating station, feeding wire from the wire supply to form a trailing loop of preselected length and indexing the trailing end of the wire to the second terminating station into alignment with a preselected terminal of the second connector part, terminating the trailing end of the wire in the preselected terminal of the second connector part and severing the trailing end so that the wire loop extends between the terminals in a plane parallel to the terminal rows, and feeding the first and second connector parts in end-to-end relation (along a path extending) through successive similar operating zones at which the said steps are repeated so that all the preselected terminals of the first connector part are progressively connected to preselected terminals of the second connector parts by respective wire loops.

2. Apparatus for making a modular electrical harness comprising a plurality of wires terminated at respective opposite ends in respective terminals of rows of terminals in first and second electrical connector parts, which apparatus comprises a series of operating zones; a connector feed path extending through all of the operating zones; each operating zone comprising: first and second terminating stations spaced apart along the feed path; a wire holding head movably mounted on support means; means mounted on the support means to index the wire holding head along the feed path between the first and second terminating stations thereby to convey leading and trailing ends of a wire extending from a wire supply successively into alignment with preselected terminals of the first and second connector parts when located on the feed path at respective terminating stations; means movably mounted in the wire holding head to terminate the leading and trailing ends of the wire respectively in the preselected terminals of of the first and second connector parts; means mounted on the support means to feed the wire from the supply through the wire holding head to form a loop of preselected length extending between the preselected terminals; means movably mounted on the wire holding head to sever the trailing end of the wire at a location between the second connector part and the wire holding head; and means movably mounted on the support means to feed first and second connector parts in end-to-end relation along the feed path through successive operating zones into alignment with successive first and second terminating stations, respectively, so that all the preselected terminals

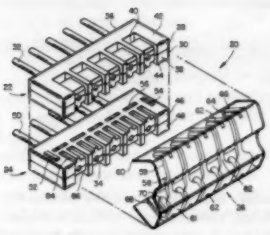
of the first connector part are progressively connected to preselected terminals of the second connector parts by respective wire loops.

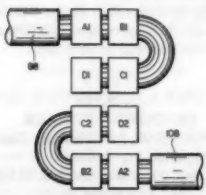
4,428,115

CABLE PRECONNECTORIZATION METHOD

Bruce D. Campbell, Portola Valley, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 27, 1981, Ser. No. 258,078
Int. Cl.³ H02G *1/14, 1/08;* H01R *4/24*
U.S. Cl. 29—873 **1 Claim**





1. A method for organizing and preconnecting a cable, the organized, preconnected cable to be pulled through a standard duct having a predetermined inside diameter, the steps of organizing and preconnectorizing comprising:

providing a cable having an outside diameter less than the inside diameter of the duct, the cable covered with a sheath extending from the first end to the second end, the cable having a core of wires, the wires being divided into binder groups;

removing the sheath a predetermined distance from the first end of the cable;

organizing the binder groups into four axially spaced apart, serially connected quarter-banks as follows:

selecting the proper number of binder groups in the first quarter-bank connectorization, such that after connection of the binder groups in the first quarter-bank to wire organizers, the outside diameter of the first quarter-bank does not exceed the outside diameter of the cable;

connecting each binder group of the first quarter-bank to a wire organizer, wherein the outside diameter of the now connected first quarter-bank does not exceed the outside diameter of the cable;

similarly, selecting the proper number of binder groups to the remaining, second, third and fourth quarter-banks;

similarly, connecting the remaining, second, third and fourth quarter-banks to wire organizers, wherein no quarter-bank exceeds the outside diameter of the cable;

attaching a pulling means to the first end of the cable, the pulling means connected to the sheath and wires at the first end, such that the maximum overall outside diameter of the cable with pulling means attached, is less than the maximum inside diameter of the duct,

providing a second cable such as the first cable, which has been similarly organized and preconnectorized;

removing the pulling means of each cable; folding back each cable at the second and third quarter-banks; matching corresponding quarter-banks such that all wire organizers are paired; and

connecting each matched pair of wire organizers of each cable by a crimp contact element.

4,428,116

SUPPORT FOR RELEASABLY RETAINING A BLADE CARTRIDGE

Evan N. Chen, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 239,847, Mar. 2, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,423
Int. Cl.³ B26B *21/06*
U.S. Cl. 30—87 **1 Claim**

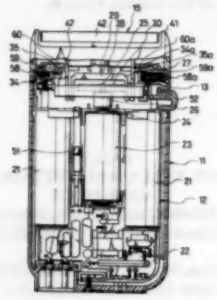
1. A support assembly for releasably retaining a razor blade cartridge comprising two relatively movable plastic elements defining a slide and a cooperating support, said support being formed with tracks for receiving and guiding projections depending from the slide, each said projection terminating in a claw operable to latch the slide permanently and slidably to the support, said support defining further a yoke having a pair of flexible arms each terminating in a stub shaft, said slide making a driving connection with said arms operative to flex the arms to open and closed positions, said slide being formed further with a plurality of individual spring means, a first spring means defining a leaf spring providing power urging the slide to its normal position relative to the track and by virtue of the driving connection between the slide and the arms insuring that the arms flex inwardly to said closed position in positive and automatic fashion to retain a cartridge releasable within the yoke and a second spring means defining a pair of L-shaped springs for urging the cartridge toward a predetermined attitude and flared fingers carried by said second spring means for homing the assembly toward the cartridge, said support being formed further with a rib straddled by a pair of spaced abutments carried by the slide to limit the stroke of the slide.

4,428,117

RECIPROCATING TYPE ELECTRIC SHAVER

Sadahige Horii; Hirozob Imai, and Tetsuo Hamashima, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 15, 1982, Ser. No. 388,721
Claims priority, application Japan, Jun. 30, 1981, 56-97957
Int. Cl.³ B26B *19/02*
U.S. Cl. 30—43.91 **6 Claims**



1. A reciprocating type electric shaver comprising:
a casing,
a driving source housed in said casing for providing an eccentric rotary force,
a driving element,
coupling means coupling said driving source to said driving element for reciprocating the latter,
said driving element including an inverted U-shaped main driving part having a horizontal web portion and vertical web portions, a connecting projection provided on said horizontal web portion, and rocking leg parts extending respectively from lower ends of said vertical web portions so as to lie parallel thereto, each rocking leg part carrying a lateral projection intermediate lower and upper ends of said rocking leg part, each projection engaging an inner surface of the casing to enable said upper ends of said rocking leg parts to reciprocate oppositely to the direction in which the horizontal web portion is reciprocated by said driving source,
said coupling means arranged to convert said eccentric rotary force into reciprocal movement and transmit said reciprocal movement to said horizontal web portion through said connecting projection of said driving element,
an inner blade assembly holding a plurality of inner cutter blades and engaged to said connecting projection of said driving element for being reciprocated with said horizontal web portion, and
an outer blade having hair inlet perforations and movably disposed at the top of said casing, said outer blade being operably connected to said upper ends of said rocking leg parts to be reciprocated oppositely to said inner blade assembly while slidably engaging cutting edges of said inner cutter blades.

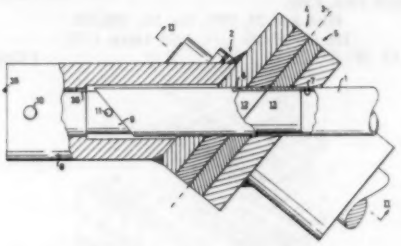
4,428,118

PIPE PARTING APPARATUS

Gunnar H. Lagher, Fjälkinge, Sweden, assignor to A.O. Arkitektkontor AB, Stockholm, Sweden, a part interest

Filed Apr. 13, 1982, Ser. No. 368,292
Claims priority, application Sweden, Apr. 22, 1981, 8102551
Int. Cl.³ B23D *21/02*
U.S. Cl. 30—92 **4 Claims**

1. An apparatus for parting pipe, where a fixed and a moving shearing member bear against each other in a cutting plane for the pipe, each member having a hole for the pipe, adjusted to the external shape of the pipe, the edges of the holes forming a fixed and a moving exterior shearing edge, and where one shearing member is provided with a mandrel adapted for supporting the bore of the pipe, said mandrel being divided into a first and a second section, which in association with the respective shearing member are mutually movable along a plane of contact coincident with the cutting plane, and which form a fixed and a movable interior shearing element, there being a



crank mechanism included in a drive means for the moving shearing member, characterized in that a single crankshaft is included in the crank mechanism and is in engagement with the moving shearing member at a mounting arrangement spaced from a bearing arrangement, with the aid of which the fixed and the moving shearing members are mutually mounted and guided, there being incorporated in the bearing arrangement an elongate hole with its longitudinal axis directed towards the crankshaft and a bolt adapted to said hole.

4,428,119

DE-ENDING SHEARS

Willie L. Turner, No. 95190, Mecklenburg Correctional Center P.O. Box 500, Boydton, Va. 23917

Filed Sep. 23, 1981, Ser. No. 305,604
Int. Cl.³ B26B *19/02*
U.S. Cl. 30—212 **2 Claims**

1. A hand operable hair cutting device comprising:
(a) an integral member having a handle portion joined to a cutting blade portion, said cutting blade portion having a plurality of cutting teeth along one side thereof and a first elongated groove in a first surface thereof, said handle portion having a finger grip, said elongated groove being disposed at the end of said integral member opposite said handle portion;
(b) a slidably moveable member mounted alongside said cutting blade portion, said moveable member having (i) a plurality of cutting teeth such that said teeth on said moveable member and on said cutting blade portion cooperate and are adapted for cutting hair received between said teeth, (ii) a second elongated groove in the surface of

said moveable member which surface is opposite to and facing said first surface such that said first and second elongated grooves are in registry, and (iii) longitudinally elongated slots extending through said moveable member;

(c) means for slidably mounting said moveable member to said cutting blade portion, said mounting means including a plurality of posts corresponding in number to the number of elongated slots in said moveable member, such that a first end of each said post joins said cutting blade portion, extends therefrom through a said elongated slot, and the second end of each said post protrudes from a said elongated slot and holds said moveable member against said cutting blade portion while permitting the sliding of said moveable member about said post through a length equivalent to a said elongated slot;

(d) a spring longitudinally pocketed by said elongated grooves when said moveable member and said integral member are slidably mounted together, said pocketed spring being disposed between said mounting means and the end of said integral member opposite said handle portion; and

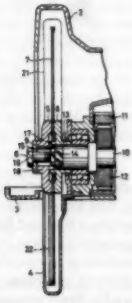
(e) a moveable handle having the first end thereof pivotably attached to said integral member where said cutting blade portion and said handle portion join together and the second end thereof forming a thumb grip, said moveable handle being in engagement with said moveable blade such that a hair clipping stroke is initiated by depressing said moveable handle towards said integral member and a reverse clipping stroke is effected upon the release of said moveable handle such that said moveable blade is reversed by said spring.

4,428,120

HOLDER FOR SUPPORTING A ROTARY CUTTING BLADE

Kiyoaki Kobayashi, and Taiichi Kumasaka, both of Katsuta, Japan, assignors to Hitachi Koki Company, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,223
Claims priority, application Japan, Apr. 24, 1981, 56-60107
Int. Cl.³ B27G *19/04*
U.S. Cl. 30—390 **13 Claims**



9. A circular saw comprising:

a body;

a saw blade having a central hole and a saw-toothed circumferential edge;

a first protective cover member fixedly mounted on said body and extending around and over said saw-toothed circumferential edge of the saw blade;

a second protective cover member movably mounted on said body and extending around and over said saw-toothed circumferential edge of the saw blade;

a base mounted on said body and having an opening in which said saw blade is rotatable;

a drive shaft rotatable about its own axis and having a larger-diameter portion and a smaller-diameter portion which are concentric with each other;

a first flange fitted over said larger-diameter portion and having an annular support extending around and spaced radially from said smaller-diameter portion, said annular support and said smaller-diameter portion having distal ends lying axially flush with each other;

first means for corotatably fixing said first flange to said larger-diameter portion;

a second flange having an annular projection insertable between said annular support and said smaller-diameter portion for sandwiching the saw blade between said first and second flanges with said annular support fitted in the central hole in the saw blade;

second means for corotatably fixing said second flange to said smaller-diameter portion; and

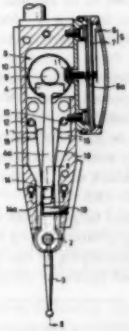
a fastener for securing said second flange axially to said smaller-diameter portion.

4,428,121

TEST INDICATOR

Kunio Yamazaki, Batho, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,126
Claims priority, application Japan, Jan. 8, 1981, 56-1084[U]
Int. Cl.³ G01B *3/22*
U.S. Cl. 33—172 B **6 Claims**



1. A test indicator wherein a rotational displacement value of a measuring element is enlarged by a sector gear rotatably supported on a main body of said test indicator and transmitted to an indicating device, wherein the improvement comprises:

a spring-engaging portion provided on said sector gear;

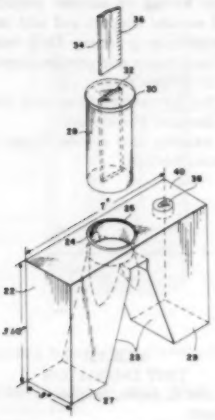
a pair of springs each resiliently engaging said spring-engaging portion of said sector gear, said springs being different in resilient force from each other and being positioned so as to urge said sector gear for rotation in opposite directions respectively; and

spring-load fine adjustment means positionally adjustably supported on said main body in abutting relation with the one of said springs having the strongest resilient force, in the urging direction of said spring having the strongest resilient force and at the side thereof so as to resist the resilient force of said spring having the strongest resilient force.

4,428,122
ROTARY TARGET V-BLOCK

Charlton W. Mann, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 30,964, Apr. 17, 1979, abandoned. This application Feb. 26, 1982, Ser. No. 352,831
Int. Cl.³ G01B *11/30*; G01C *15/00*
U.S. Cl. 33—293 **6 Claims**



1. An alignment device comprising:
an elongated member to be aligned having a surface thereon;
holder means adapted to be placed at any position along said elongated member to be aligned;
said holder means being a V-block having a hole therethrough at the apex thereof the top of said hole containing a recessed lip;
means for determining and establishing a reference plane;
target means supported by said V-block movable with respect thereto enabling siting from any angle;
said target means being a scale carried by a rotatable plug;
said rotatable plug positioned by the recessed lip within the hole of said V-block such that said plug may rotate while within said hole; and
means for siting said target means supported by said holder means at various positions along said elongated member to determine the variations of the elongated member to be aligned from said reference plane.

4,428,123
INSTRUMENT MOUNTING

Rand H. Hulsing, II, and John A. Morrow, both of Redmond, Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

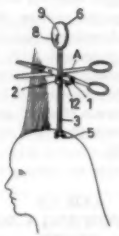
Filed Jan. 28, 1982, Ser. No. 343,561
Int. Cl.³ E21B *47/022*
U.S. Cl. 33—313 **17 Claims**

1. In a sensitive instrument for use in an environment where the instrument is subject to mechanical shock, the instrument having a cylindrical instrument package and a cylindrical outer housing, an improved mounting for the instrument package inside the housing, comprising:
first and second plugs at opposite ends of the housing and cooperatively capturing the ends of the package to confine longitudinal shifting of the package relative to the housing;
a conical recess in each of said first and second plugs, said recesses opening, each toward the other, receiving the ends of the instrument package and maintaining the instrument package substantially centered in the housing; and
resilient cushion members between each plug and the adjacent end of the instrument package which absorb longitudinal and radial shock.

4,428,124
HAIRCUTTING ANGLE INDICATOR

Hiromi Asakura, 7-39, 2-chome, Matsushima-cho, Takamatsu-shi, Kagawa, Japan

Filed Dec. 22, 1981, Ser. No. 333,617
Int. Cl.³ B26B *13/22*
U.S. Cl. 33—334 **7 Claims**



1. A hair-cutting angle and distance indicator for use with scissors while cutting hair on a person's head, comprising:
an elongated bar having a first end for engaging the head and a second end opposite said first end;
an angle gauge including a circular dial having angular indicia marked thereon in a plane parallel to the length of said bar, and a needle freely rotatably mounted to said dial for rotation about an axis perpendicular to said plane along said indicia such that said needle is drawn by gravity into a generally vertical orientation, said gauge being mounted to said second end of said bar; and
means for mounting the scissors to said bar so as to be movable therealong between said first and second ends such that the scissors are usable to cut hair at a desired distance from the head, said needle hanging vertically downward so as to indicate the angle of cutting by the scissors with respect to the vertical.

6. A hair cutting indicator for attachment to a scissors having cutting edges which pivot about a pivot axis and mate along a cutting direction, comprising:
a longitudinally extending member having a first end and

and a second end, and having first angular indicia thereon formed about the longitudinal axis thereof indicative of the angle of the cutting direction about the pivot axis;

an angle gauge for indicating the angle of the cutting direction with respect to the vertical, including a circular dial having second angular indicia thereon in a plane and a needle freely rotatably mounted for rotation about an axis of rotation perpendicular to said plane along said second indicia so as to be drawn by gravity into a generally vertical orientation, said gauge being mounted to said first end of said member such that said axis of rotation is perpendicular to said longitudinal axis, and

means for mounting said member to the handle of the scissors.

4,428,125

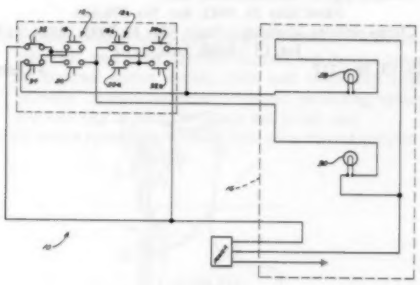
INCLINATION INDICATING APPARATUS

Ivan R. West, Jr., 102 Rothmoor Dr., Gilbert, Iowa 50105

Filed Jan. 4, 1982, Ser. No. 336,913

Int. Cl.³ G01C *9/06*

U.S. Cl. 33—366 **3 Claims**



1. Inclination indicating apparatus for use with a drill assembly mounted on a boom structure for drilling holes in a conventional mining operation, comprising:

inclination detector means for determining whether the angle of inclination of the hole being drilled is within predetermined parimeters, including a first and second gravity activated switching device, each of said switching devices electrically connected to a source of electrical energy and having a controlled switching axis about which the switching devices move resulting in a switching action and providing a controlled output in response thereto, the first switching device being alligned at a predetermined angle relative the longitudinal drilling axis of the boom and the second switching device being aligned relative the first switching device and switching at a second predetermined angle;

read out means coupled to the inclination detector means for producing a read out indication to a drill operator in response to the output received from the inclination detector means.

4,428,126

APPARATUS FOR CONTINUOUSLY MONITORING THE SHAFT ALIGNMENT BETWEEN TWO ROTATING MACHINES

Burke D. Banks, West Columbia, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1981, Ser. No. 332,436

Int. Cl.³ G01B *7/31*

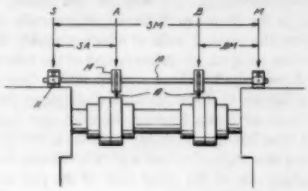
U.S. Cl. 33—412 **1 Claim**

1. An apparatus for monitoring the parallel alignment of rotating shafts of two machines which are coupled through their shafts, comprising

an anchor member removably fixedly attached to each machine at an offset but parallel aligned position;

a bar of sufficient length to span the distance between the two anchor members;

a holder for said bar attached in a pivotal manner to each of said anchor members;



two adjustable slide members mounted on the bar having slidably adjustable hangers depending therefrom; and

a pair of electrical probes secured in said hangers.

4,428,127

DRYING APPARATUS FOR DYEING BOBBINS IN THE TEXTILE INDUSTRY

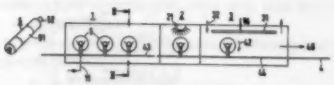
Hans-Christian Grassmann, Baiersdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,964

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142172

Int. Cl.³ F26B *13/10*; **D06B** *15/00*

U.S. Cl. 34—1 **6 Claims**



1. In drying apparatus for dyeing bobbins of the kind used in the textile industry and which are dyed in a process in which a plurality of bobbins are simultaneously slipped onto a perforated tube, through which the liquid dyeing agent is forced into and through the thread or yarn wound on the bobbin core for dyeing, said apparatus including:

(a) a mechanical predrying device for the bobbins; and

(b) a high frequency oven into which hot air can also be blown, the improvement comprising:

(c) the predrying station including means for blowing compressed air into the tube with bobbins slipped thereon;

(d) an intermediate drying station following thereafter for drying off the surfaces of the dyeing bobbins slipped onto the tube;

(e) a final drying station following thereafter including the high frequency oven for the capacitive final drying of the bobbins on the tube; and

(f) a transporting device for the automatic transport of the dyeing bobbins slipped onto the tube through the individual stations and including, at least in the region of the high-frequency oven, means for rotating the tube with the bobbins about its longitudinal axis.

4,428,128

JET TUBE DRYER RETAINER SYSTEM

Fred Coulson, Eagle Point, and Jerry M. Smith, Portland, both of Oreg., assignors to The Coe Manufacturing Company, Painesville, Ohio

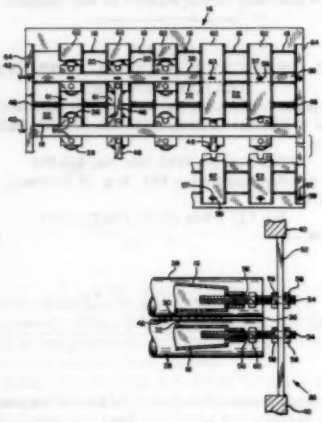
Filed Feb. 4, 1982, Ser. No. 345,621

Int. Cl.³ F26B *13/04*

U.S. Cl. 34—155 **4 Claims**

1. A retainer system for installing a grid of readily removable replacement jet tubes in a jet tube sheet dryer, said dryer

having a dryer frame with multiple lateral dryer decks which include opposed pairs of sheet conveyor rollers extending transversely across the dryer for conveying sheets to be dried between said opposed pairs of rollers, and a plurality of pairs of longitudinally-extending replacement jet tubes, extending transverse to the sheet, each having a generally rectangular cross section, the vertical walls of which gradually taper longitudinally from an open, air-delivery end of the tube to a generally closed end which defines a small orifice therein so as to maintain generally uniform pressure throughout the length of the tube in an airstream flowing therethrough, each said replacement tube having a plurality of holes in the longitudinally-extending side thereof which is parallel to and closest to the corresponding side of the other tube of the pair so that each tube directs a plurality of airstreams toward the other tube of the pair at said sheets which are conveyed between said pair of jet tubes by said rollers, said retainer system comprising:



(a) tube seat means, laterally fixed intermediate the dryer decks and having a flat upper surface for supporting the replacement jet tubes thereon;

(b) a plurality of vertical strengthening members fixedly attached to the dryer frame and said tube seat means and located at the air-delivery end of the dryer;

(c) retainer plate array means detachably connected to the air-delivery end of the dryer for retaining the replacement jet tubes in the dryer frame and for preventing free passage of forced air into the dryer except through the holes of the jet tubes, said retainer plate array means being readily detachable for removal and reinstallation of the replacement jet tubes; and

(d) replacement jet tube mounting means for detachably mounting the generally closed end of the respective tubes in a position which is fixed laterally and vertically with respect to the rollers while allowing longitudinal expansion movement of said closed end of the respective tubes.

4,428,129

MOLDED SHOE SOLE CONSTRUCTION

Paul Jones, Jr., Falmouth, Me., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,671

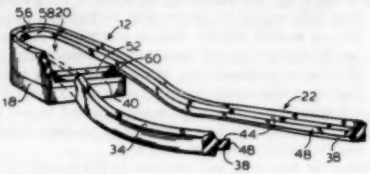
Int. Cl.³ A43B *13/28, 15/00*

U.S. Cl. 36—245 **22 Claims**

13. A trim piece for use in manufacturing a unit sole assembly, comprising:

a heel; and

a resilient outsole edging portion integral with said heel, said outsole edging portion capable of being stretched and



fitted about the circumferences of outsoles of a plurality of sizes.

4,428,130

INNER BOOT STRUCTURE PARTICULARLY FOR SKI BOOTS

Riccardo Perotto, Volpago Del Montello, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed May 14, 1982, Ser. No. 378,446

Claims priority, application Italy, May 19, 1981, 21814/81[U]

Int. Cl.³ A43B *5/04, 3/10*

U.S. Cl. 36—117 **4 Claims**

1. An inner boot structure particularly for ski boots, comprising a body for enclosing a skier's foot region, a leg portion extending from said body, a cutout formed in said leg portion and extending longitudinally, a pair of flaps adjacent said cutout and arranged to overlap each other, and closure means for said inner boot located along said flaps.

4,428,131

EXCAVATING TOOTH

Frederick C. Hahn, Aloha, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Apr. 26, 1982, Ser. No. 372,171

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—142 R **8 Claims**

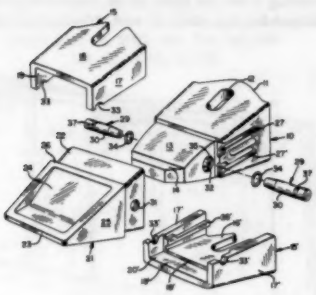
8. A tooth assembly for earth working equipment comprising

a relatively elongated adapter having top, bottom and side surfaces and means at the rear end thereof for attachment to said equipment and nose means at the forward end for receiving a point attachable on said adapter by movement along a longitudinal axis, said nose means terminating in spaced apart top and bottom stabilizing surfaces arranged on opposite sides of said axis, said adapter also having side slots for supporting a wear cap on said top surface to protect said adapter against wear from earth passing thereover,

a generally U-shaped wear cap removably mounted on said adapter covering at least a portion of said top surface and having inwardly extending side rails engaging said adapter slots, said wear cap having an internal recess forming a perimetric flange adjacent the forward end thereof,

a relatively elongated point removably mounted on said nose

means having a bit at the forward end thereof and the complement to said nose means at the rear end thereof, said complement to said nose means terminating in a pair of spaced apart stabilizing surfaces arranged on opposite sides of said axis, said point having forwarding convergent



top and bottom walls and generally vertically extending sidewalls, said point adjacent the rear end thereof having an external recess mating with said wear cap recess whereby recesses cooperate with said stabilizing surfaces and reacting to beam forces on said point, and

lock means releasably securing said point to said adapter.

4,428,132

TRENCHING PLOW WITH PLOW CARRIAGE ON CURVED SUPPORTING TRACK

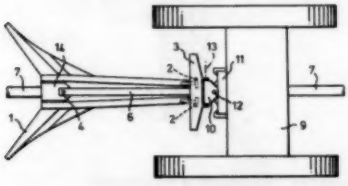
Alan R. Reece, Wylam, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Sep. 8, 1982, Ser. No. 416,077

Claims priority, application United Kingdom, Sep. 11, 1981, 8127567

Int. Cl.³ E02F *5/18*; F16L *1/04*

U.S. Cl. 37—193 **9 Claims**



1. A trenching plough and a carriage therefor for making a trench for a previously laid cable or pipeline, the plough having a cutter and means located forward with respect to the cutter for following the previously laid cable or pipeline, the plough being connecied to the carriage so that the front of the plough is supported by the carriage, the plough having a towing member by means of which it is drawn by the carriage, there being pivotal movement about a vertical axis between the towing member and the body of the plough and between the towing member and the carriage, the front of the body of the plough running in a latterally extending curved track supported by the towing member so that the front of the plough can move in an arc within the limits set by the track.

4,428,133

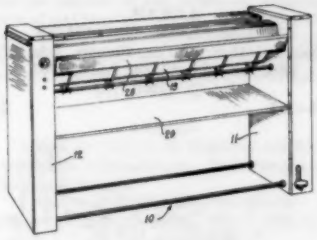
HEAT EXCHANGER FOR FLATWORK IRONER'S

Eduard Kamberg, Chicago, Ill., assignor to New Super Laundry Machinery Co, Inc., Chicago, Ill.

Filed Sep. 24, 1982, Ser. No. 422,895

Int. Cl.³ D06F *65/02*

U.S. Cl. 38—44 **4 Claims**



1. A heat exchanger for a commercial laundry flatwork finisher having a rotatable finishing roller comprising,

(a) an ironing member having a chest surface with a configuraion proportional to the diameter of the finishing roller,

(b) a fluid cavity formed on the back side of said chest surface of said ironing member adapted to be filled with a heat transfer liquid,

(c) means for heating the liquid within said fluid cavity,

(d) temperature sensing means within the liquid in said cavity for indicating temperature thereof,

(e) an expansion tank in communication with said fluid cavity, and

(f) means providing open communication between said expansion tank and said fluid cavity.

4,428,134

CLOSURE TAB

Orlan M. Arnold, Norwalk, Conn., and Billy P. Noyes, 104 E. Rock Rd., Norwalk, Conn. 06851, assignors to Billy P. Noyes, Greenwich, Conn.

Continuation of Ser. No. 139,912, Apr. 14, 1980, abandoned. This application Oct. 21, 1982, Ser. No. 435,658

Int. Cl.³ A44C *3/00*

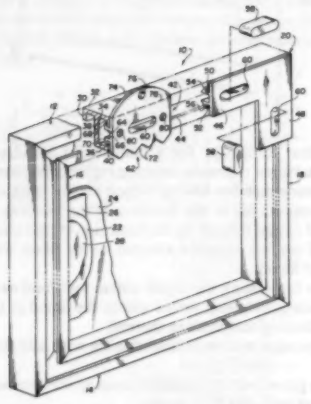
U.S. Cl. 40—2 R **13 Claims**

1. A closure tab which is readily coded by printing means and used for securing and closing the bag neck of a flexible bag containing merchandise comprising:

a composite comprising a substantially rigid substrate, said substantially rigid substrate being characterized by sufficient rigidity so as to allow same to readily secure to and close the bag neck of a flexible bag, a thin layer of adhesive applied to one side of said substantially rigid substrate and bonded thereto, said thin layer of adhesive being adapted to receive a print sensitive medium, a print sensitive medium applied to said thin layer of adhesive on said one side of said substantially rigid substrate and bonded

thereto so as to form said composite, said print sensitive medium being readily coded by said printing means while bonded to said substantially rigid substrate forming said composite wherein an edge portion of the composite is provided with means for receiving the bag neck of a flexible bag containing merchandise for securing and closing said flexible bag.

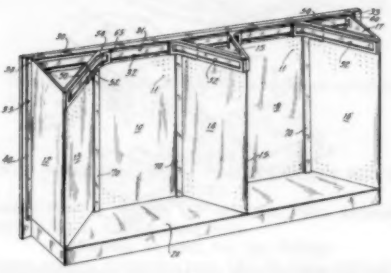
4,428,135
PICTURE FRAME ASSEMBLIES
David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022
Filed Jan. 10, 1983, Ser. No. 456,707
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—155 **22 Claims**



1. A frame assembly comprising a plurality of border members arranged end to end to form a frame, each border member having a front, side and rear wall including a channel defined at least in part by said rear wall, said rear wall having a slot extending substantially the length thereof and opening into said channel, a plurality of corner brackets securing a different pair of adjacent border members together, and at least one hanger bracket for attaching the frame to a wall or the like, each of said corner brackets and hanger brackets comprising a flat base member having a pair of spaced ribs extending parallel to each other outwardly from one surface, each of said ribs having a flange at the end thereof, the flange of one rib extending in a direction opposite to that of the other rib, said ribs being flexible relative to said base members so as to be insertable within said slot having said flanges engage the inner surface of said rear wall.

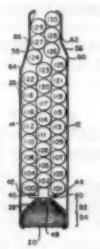
4,428,136
ADJUSTABLE MULTI-BAY DISPLAY
Robert P. Franklin, Lake Hopatcong, N.J., assignor to Trans-World Manufacturing Corporation, East Rutherford, N.J.
Filed Mar. 1, 1982, Ser. No. 353,488
Int. Cl.³ G09F *7/00*; A47B *57/00, 47/00*
U.S. Cl. 40—605 **12 Claims**

1. An adjustable display unit comprising:
a principal display wall;
a principal header for said principal display wall protruding therefrom and extending longitudinally thereof, said principal header adapted to provide a support for placards or other information bearing devices, said principal display header extending substantially the entire length of said principal display wall;
a plurality of pairs of panels, each panel of said pair of panels being hingedly connected to the other panel in said pair;
means for mounting each said pair of panels to said principal display wall at any of a number of possible locations along said principal display wall so as to create individual display bays of desired sizes, with each of said pair of panels forming a triangle with a respective portion of said principal display wall; and
a plurality of subsidiary headers each attached to a respective one of said panels, each of said subsidiary headers extending from the front of its respective panel to said principal header, each of said subsidiary headers being



curved to give the appearance of merging into said principal display header, each of said subsidiary headers being movable, with the panel to which it is attached, with respect to said principal header so that each said subsidiary header appears to merge with that portion of said principal header which it is located adjacent to and said adjustable display unit gives the appearance of a single continuous display unit.

4,428,137
CARTRIDGE MAGAZINE
James H. Johnson, 818 S. Willow Ave., Tampa, Fla. 33606
Filed Oct. 13, 1981, Ser. No. 311,089
Int. Cl.³ F41C *25/02*
U.S. Cl. 42—50 **14 Claims**



1. A magazine, comprising in combination:
a housing including left and right side walls;
said left and right side walls being configured to define a storage zone for storing a plurality of cartridges in a three column array, a compression zone for compressing the three column array into a two column array, and a feed zone for storing the two column array in a two-position feeding arrangement;
a follower positioned beneath the plurality of cartridges;
means for urging said follower against the plurality of cartridges; and
said follower including left and right side platforms and a raised central platform for engagement with the left, right and central columns of cartridges, respectively, of the three column array enabling said follower to exert pressure up-

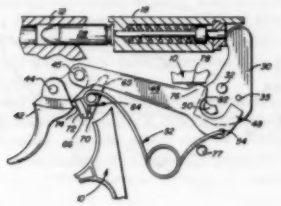
wardly against the cartridges and to be centrally located by means of the three column array.

4,428,138

DOUBLE-ACTION TRIGGER MECHANISM WITH TRIGGER-BLOCKING MAGAZINE SAFETY FOR FIREARMS

Louis W. Seecamp, 487 Wolcott La., Orange, Conn. 06477

Filed Apr. 19, 1982, Ser. No. 369,604
Int. Cl.³ F41C *17/02*
U.S. Cl. 42—70 A **7 Claims**



1. In a double-action trigger mechanism for semi-automatic firearms having a trigger and a hammer both pivotally mounted on a frame in spaced relation to each other, a trigger-blocking member pivoted to said frame for movement out of a blocking position when a cartridge-magazine is inserted into place, and a draw-bar pivotally connected to said trigger and extending into operative relation with said hammer for cocking said hammer when said trigger is pulled moving said draw-bar in one direction,

a spring pivotally mounted on a pivot pin for said trigger-blocking member and having one end urging said trigger-blocking member toward its blocking position,

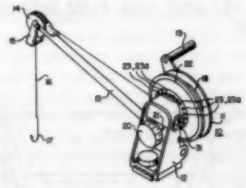
the other end of said spring being fixed to said draw-bar and urging it in a direction both into operative relationship with said hammer and generally in a direction for returning said trigger when it is released.

4,428,139

TROLLING APPARATUS

Walter J. Henze, Norristown, and William Purcell, Philadelphia, both of Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Jul. 20, 1981, Ser. No. 284,704
Int. Cl.³ A01K *89/015*
U.S. Cl. 43—20 **1 Claim**



1. In trolling apparatus for fishing, which includes a base, a spool for carrying a supply of line rotatably mounted on said base, a boom secured at one end to said base, which boom has a pulley at its free end over which the line extends, the improvement which comprises,

audible signal means comprising a bracket mounted on said base contiguous to one side face of the spool,

said side face having in a circular arrangment thereon a plurality of members,

said bracket having a first pin resiliently urged toward said members to provide upon engagement with said members and rotation of said spool an audible signal,

said first pin being movable to a retracted position to prevent engagement of said pin with said members thereby to prevent an audible signal,

a control member for said first pin which comprises a handle secured to said pin for moving said first pin to a retracted position,

a second pin secured to said handle for engagement in a portion of said bracket to permit engagement of said first pin with said members to provide an audible signal, and

said handle being rotatable after said second pin is retracted to prevent engagement of said first pin with said members.

4,428,140

GUIDE DEVICE FOR FISHING LINES

Shigeru Yamamoto, Higashikurume, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,133
Claims priority, application Japan, Mar. 7, 1980, 55-29722[U]
Int. Cl.³ A01K *87/04*
U.S. Cl. 43—24 **13 Claims**

6. A stamped one-piece flat metal blank for producing a line guide device comprising a guide ring portion, a base portion at one side of said ring portion, a pair of leg portions extending in opposite directions from said base portion, one of said leg portions extending into said guide ring portion and the other of said leg portions extending outwardly of said ring portion, said leg portions being aligned with each other, and the tip portions of said leg portions being adaptable to be used as means to fit said device onto a fishing rod after said blank is bent into said device.

4,428,141

LINE GUIDE FOR FISHING RODS

Oscar Kovalovsky, 11154 Debby St., North Hollywood, Calif. 91606

Filed Feb. 10, 1982, Ser. No. 347,718
Int. Cl.³ A01K *87/04*
U.S. Cl. 43—24 **10 Claims**

1. A fishing line guide comprising:

a yoke having spaced apart sideplates connected at one end by a bridge;

a spool roller having a reduced central or mid-section;

a pair of end caps separated by said spool roller and said end caps coupled together by a fixed shaft;

bearing means movably mounting said spool roller on said shaft;

said spool roller includes recesses provided at its opposite ends for seating said bearing means so that the ends of said spool roller and said bearing means are co-extensive; and

a pair of mounting members pivotally carried in spaced apart relationship on opposite ends of said yoke so that said yoke can flex with respect to said mounting members.

4,428,142

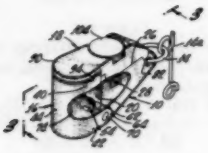
OUTRIGGER FISHING CLIP

William D. Shedd, Mission Viejo, and Robert C. Eschbach, Newport Beach, both of Calif., assignors to Axelson Fishing Tackle Mfg. Co. Inc., Irvine, Calif.

Filed Sep. 8, 1981, Ser. No. 299,713

Int. Cl.³ A01K *91/00*

U.S. Cl. 43—43.12 **12 Claims**



1. A releasable roller clip comprising

a clip body,

means on the body for securing it to a support,

a releasable arm pivoted to said body for motion between a first position in which a portion of said arm adjacent said body is spaced from the body to define a line receiving cavity closed at opposite ends of said arm, and a second position in which one end of said arm is away from said body,

a roller journaled to said arm and having a surface in said cavity spaced from said body, whereby the force exerted by a tensioned line extending over said roller through said cavity tends to pivot said arm and roller away from said body,

means for retaining said arm in said first position, said arm being generally U-shaped, having first and second legs interconnected by a bight, a shaft extending between said legs, said roller being journaled on said shaft, one of said legs extending past said cavity and being pivoted to said body about an axis perpendicular to said shaft.

4,428,143

STOPS FOR LINES

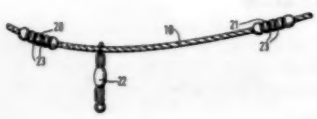
Willy Keller, Imbishühlstr. 12, CH-8049 Zürich, Switzerland

Filed Mar. 20, 1981, Ser. No. 246,041

Claims priority, application Switzerland, Mar. 28, 1980, 2457/80

Int. Cl.³ A01K *91/00*

U.S. Cl. 43—44.9 **9 Claims**



1. A stop for a synthetic monofilament fishing line, said stop having a pair of elongated body halves of synthetic thermoplastic material hinged together for closing over and about a fishing line of synthetic monofilament plastic material, at least one of said halves having a longitudinal recess for receiving the fishing line and elevations thereon for abutting a surface of the other of said halves upon hinging together of said halves, said elevations functioning as flux material on thermowelding of said halves together and to the synthetic fishing line, and a plurality of longitudinally spaced radial grooves in an outer periphery of each body half to reduce the wall thickness of said half thereat and impart pliability to said stop when thermowelded to the fishing line.

4,428,144

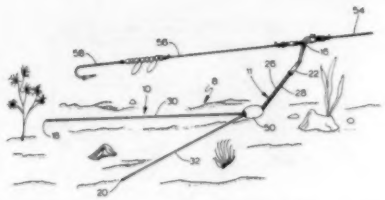
FISHING DEVICE

Robert J. Dickinson, Mitchell, S. Dak., assignor to James L. Wagner and Dennis R. Padrnos, both of Mitchell, S. Dak., part interest to each

Filed May 7, 1982, Ser. No. 375,958

Int. Cl.³ A01K *95/00*

U.S. Cl. 43—44.96 **30 Claims**



1. An underwater bottom-engaging sinker holder and lure support device comprising:

first and second wire trailing legs, each trailing leg having a forward end and a free trailing end;

connecting means for connecting the forward ends of the trailing legs to each other, so that the trailing legs have a first generally parallel position in which the trailing legs are adapted to receive a bored sinker mounted over the free trailing ends and slid to a position adjacent the connecting means, and a second position in which the trailing legs are spread, by separating the free trailing ends, to hold the sinker in its position and to form a generally V-shaped support base;

an upstanding section with at least one upstanding wire leg having a lower end fixedly held in the first connecting means, so that the upstanding leg is maintained in a position off the bottom above the plane of the bottom-engaging support base; and

attachment loop means in the upstanding leg for attaching a fishing line and lure leader, located above and forward of the trailing ends of the trailing legs.

4,428,145

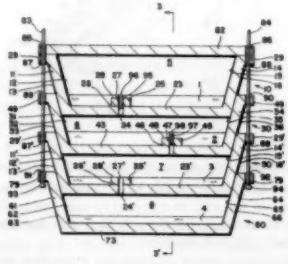
SHRIMP BAIT CONTAINER

Robert Wheeler, 823A E. Gulf Blvd., Indian Rocks Beach, Fla. 33535

Filed Aug. 10, 1981, Ser. No. 291,317

Int. Cl.³ A01K *97/04, 63/02*; B65D *21/08*

U.S. Cl. 43—55 **9 Claims**



4. A shrimp bait container, including a plurality of stacked trays, each said tray, which stores shrimp bait in a water medium, comprising:

a substantially frusto-pyramidal shaped housing having four sides and a bottom composed of a relatively thick, thermally insulating material, said sides extending upwardly and outwardly from said bottom and inclined so that the outer surfaces thereof for an upper one of said plurality of trays will mate with the inner surfaces thereof for an adjacent lower one of said plurality of trays, forming an enclosed volume for storing said water medium, said bottom having a perforation therethrough;

an adjustable water-depth controlling pipe slideably mounted in substantial vertical orientation in said perforation in said bottom of said housing, with an upper entrance having a height above said bottom of said housing which can be selectively adjusted and through which said water within said enclosed volume may overflow, defining the depth of said water;

whereby said shrimp bait can be preserved alive in a thermally insulated environment having an adjustable depth for said water medium which can be conveniently refreshed by cascading through said plurality of stacked trays.

4,428,146

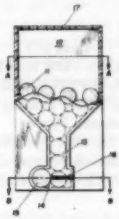
FISH BAIT DISPENSER

Wilbert L. Walker, R.D. #4, Box 267, Somerset, Pa. 15501

Filed Aug. 4, 1982, Ser. No. 405,298

Int. Cl.³ A01K *97/04*

U.S. Cl. 43—55 **4 Claims**



1. A container for holding and dispensing individual units of fish bait, comprising: a container having an entry opening for receiving fish bait units into a holding area, said holding area being connected to a transfer area in a manner that will cause fish bait units to pass from said holding area into said transfer area in an aligned manner, said transfer area being sized so as to accommodate fish bait units in a single row and being generally perpendicularly connected to an elongated fish bait unit dispensing area, said fish bait unit dispensing area being positioned and sized so as to receive and hold one fish bait unit at a time from said transfer area in an area proximate to said transfer area, said dispensing area having an elongated portion extending away from said proximate area and sized to contain one fish bait unit, a slot extending along an elongated axis of said dispensing area, and an exit opening for removal of said fish bait unit whereby a fish hook may be inserted through said slot at a location proximate to said transfer area to engage a waiting fish bait unit and then said hook passed along said slot until said exit opening is in alignment so as to be able to remove said engaged fish bait unit and hook from the dispenser opening.

4,428,147

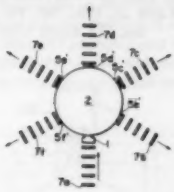
DOMINO TOPPLING TOY

Takashi Yoshida, Tokyo, Japan, assignor to Kabushiki Kaisha Takemi, Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,058

Int. Cl.³ A63H *33/00*

U.S. Cl. 46—1 R **5 Claims**



1. A domino toppling toy comprising:

a housing defining an internal space therein;

an actuation lever having a first outer portion extending from said housing and a first inner portion extending into said internal space, and being pivotally mounted on said housing so that when a first domino train acts on said first outer portion said actuation lever pivots to raise said first inner portion; and

a plurality of domino toppling levers, each lever having a second outer portion extending from said housing and a second inner portion extending into said internal space, and being pivotally mounted on said housing so that when said first inner portion is raised said second inner portion is also raised allowing said each lever to pivot, whereby a plurality of the other domino trains are urged to topple by respective said second outer portions.

4,428,148

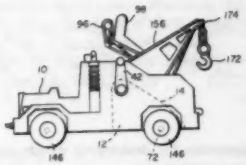
INERTIA FLYWHEEL DRIVE MECHANISM FOR A TOY VEHICLE

Carl M. Stern, East Aurora; William M. Maher, Churchville, and Michael T. Ventre, Blasdell, all of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 5, 1982, Ser. No. 346,163

Int. Cl.³ A63H *33/30, 29/20*

U.S. Cl. 46—40 **12 Claims**



1. A toy vehicle comprising:

a ground engaging drive wheel selectively rotatable in opposite directions for driving the vehicle in forward and reverse directions;

winch means comprising a drum selectively rotatable in opposite directions for winding or unwinding a cord;

an inertia flywheel for driving said drive wheel and said winch means;

a main drive gear coupled to said flywheel;

means coupled to said main drive gear and flywheel for rotating said main drive gear and flywheel in only one direction;

first transmission means pivotal on a shaft for coupling said rotating main drive gear to said drive wheel for driving the vehicle in one of said forward and reverse directions; and

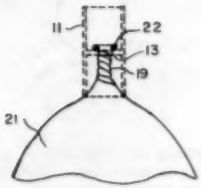
second transmission means pivotal on said shaft for coupling said rotating main drive gear to said winch means for winding or unwinding the cord.

4,428,149

TOY BALLOON CLOSURE DEVICE

Paul L. Brown, 982 Lakeview Way, Redwood City, Calif. 94062

Filed Jun. 21, 1982, Ser. No. 390,335
Int. Cl.³ A63H 3/06
U.S. Cl. 46—90 5 Claims



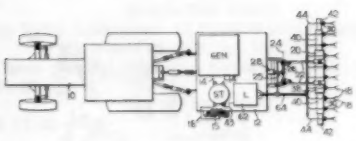
1. A toy balloon closure device comprising a tubular body having a longitudinal extending slot therein, an interior divider separating said tubular body into a pair of compartments; said divider having a central hole therein, one of said compartments receiving the twisted stem of an inflated toy balloon under tension through said slot, and the other of said pair of compartments receiving the lips of the inflated toy balloon under tension against the hole of said divider whereby to seal the inflated balloon and to hold the same in a horizontal, vertical or angular position.

4,428,150

ELECTRODE ARRANGEMENT FOR ELECTRIC WEED KILLING APPARATUS

Allois F. Geiersbach, Milwaukee, and Thomas P. Gilmore, Wauwatosa, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 315,137, Oct. 26, 1981, abandoned.
This application Jun. 29, 1983, Ser. No. 508,995
Int. Cl.³ A01M 21/00
U.S. Cl. 47—1.3 7 Claims



1. Apparatus for destroying weeds growing in and around crop rows comprising

a vehicle,

a source of high voltage electricity mounted on said vehicle,

means on said vehicle for connecting said high voltage source to ground,

a plurality of weed contacting electrodes carried on said vehicle and insulated therefrom, and

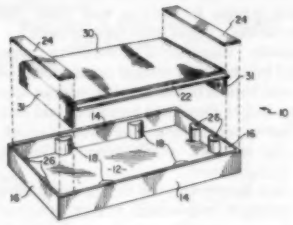
means including a plurality of isolating electrical reactance elements each of which is in series with one of said weed contacting electrodes for connecting said high voltage source to said electrodes so that each said isolating reactance element limits the current flowing through the electrode in series therewith when said electrode contacts a weed and prevents high voltage drop across the equivalent impedance of said high voltage source so the voltage on the outer electrodes remains sufficiently high to destroy weeds contacted by them.

4,428,151

PLANT WATERING AND HUMIDIFYING APPARATUS

Gary D. Solomon, 23 Harrow La., Levittown, N.Y. 11756

Filed Dec. 2, 1980, Ser. No. 212,203
Int. Cl.³ A01G 27/00
U.S. Cl. 47—81 15 Claims



1. Apparatus for watering and humidifying plants comprising:

a tray for holding water,

support means within said tray,

a mat on said support means at least a part of which is adapted to dip into the tray to communicate with the water therein,

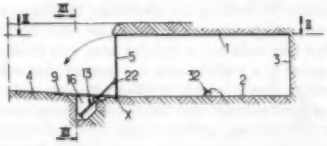
said mat formed by a composite of a lower layer of a fabric of a pile-type material to conduct water by a wicking action and an upper layer of a harder finish than the lower layer to conduct water but at a lesser rate than said lower layer and to protect the lower layer.

4,428,152

SWINGING DOORS FOR SHELTERS AND TO SHELTERS EQUIPPED WITH SUCH DOORS

Leon Gubri, Neuilly-sur-Seine, France, assignor to Etablissements L. Gubri, Deschanel, France

Filed Oct. 13, 1981, Ser. No. 310,843
Claims priority, application France, Oct. 14, 1980, 80 21973
Int. Cl.³ E06B 11/00
U.S. Cl. 49—131 9 Claims



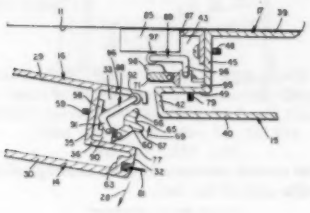
1. A swinging door for an underground aircraft shelter, characterized in the said door comprises a thick panel mounted for swinging about a lower horizontal axis and associated with external operating jacks whose axes are inclined with respect to the horizontal while being mounted so as to be pivotable slightly about lower fixed pins parallel to said horizontal axis, said jacks, in their retracted position, being retracted into closed pits and arranged so as to bear in the manner of trunnions having axes parallel to said horizontal axis against complementary bearing surfaces provided on the external face of the panel.

4,428,153

RECESSED ASTRAGAL FOR DOUBLE DOOR

John C. Klinger, Decatur, and Grayle S. Nesbit, Stone Mountain, both of Ga., assignors to Atlanta Richfield Company, Los Angeles, Calif.

Filed Mar. 8, 1982, Ser. No. 355,667
Int. Cl.³ E05C 7/04
U.S. Cl. 49—366 **4 Claims**



1. An astragal assembly for the meeting edges of the doors in a double swinging door installation, wherein two doors are hung on hinges in a frame and the meeting vertical edge portions of the doors each include an inner wall, an outer wall and a vertical channel formed between said inner and outer walls and extending along the door edge and facing the opposite door, the improvement therein comprising:

an elongated leaf pivotably mounted in the channel of each door and extending substantially the full height of its door, each said leaf being pivotable between a first position where the leaf protrudes out of its channel toward engagement with the leaf of the other door and a second position in which the leaf is substantially retracted into its channel;

biasing means mounted on each door for urging the leaf of each door toward its retracted position;

door stop means for mounting in the door frame of the doors at the meeting edge portions of the doors when the doors are in their closed positions for urging the leaves of the doors toward their protruding positions;

a support step on each door and extending in a plane substantially parallel to its outer wall and located adjacent its outer wall in the meeting vertical edge portion of the door;

an elongated hinge base mounted in abutment with the support step of each door and extending substantially the full height of the door; a series of hinge bosses formed on said hinge base; and

said leaves each including a series of hinge bosses for alignment between the hinge bosses of a hinge base in each door and hinge pins extending through the hinge bosses of the hinge bases and their respective leaves.

4,428,154

WINDOW SAFETY LOCK

David M. Rinehart, Selma, Ala., assignor to DISCO Aluminum Products Company, Inc., Selma, Ala.

Filed Jun. 1, 1982, Ser. No. 383,577
Int. Cl.³ E05D 15/00
U.S. Cl. 49—390 **14 Claims**

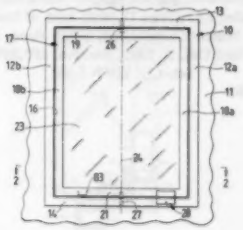
1. A safety lock for a window unit having a sash mounted for pivotal movement about a centrally disposed vertical axis within a sash opening defined by horizontal upper and lower frame members and spaced apart vertical side frame members,

(a) an elongated, horizontal lock assembly housing mounted on the lower frame member intermediate said vertical axis and one of said side frame members with an elongated, vertically extending locking member mounted for vertical movement relative to said housing selectively to an unlocked position with an upper portion of said locking member being spaced from the upper surface of said housing and to a locked position with said upper portion being adjacent said upper surface of said housing,

(b) a lock assembly within said lock assembly housing operatively connected to a lower portion of said locking member,

(c) an elongated, horizontal latch assembly housing carried by a lower portion of said sash intermediate said vertical axis and said one of said side frame members,

(d) an elongated, horizontal connector arm pivotally connected at one end to a lower portion of said latch assembly housing with its other end engaging said locking member to permit pivotal movement of said sash relative to said sash opening selectively to a closed position and to a limited open position,



(e) stop means carried by said lock assembly housing and engaging said lock assembly to positively retain said other end of said connector arm in engagement with said locking member while said sash is in said closed position and in said limited open position,

(f) a release element having a portion thereof adapted to engage said lock assembly and move said locking member toward its unlocked position to permit said other end of said connector arm to engage and disengage said locking member so that said sash is adapted for free pivotal movement beyond said limited open position while said locking member is disengaged, and

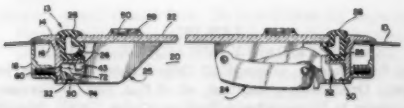
(g) resilient means within said lock assembly housing urging said locking member toward its locked position.

4,428,155

RELEASABLE HINGE DEVICE FOR REMOVABLE PANELS

Gerald A. Kwan, Pasadena; John Lehne, Hacienda Heights, and Ronald E. Wooten, Sunnymead, all of Calif., assignors to Le Van Specialty Co., Inc., City of Industry, Calif.

Filed Jan. 15, 1982, Ser. No. 339,329
Int. Cl.³ E05C 21/02
U.S. Cl. 49—465 **12 Claims**



1. In combination, a quick-release-hinge device adapted to be releasably coupled between a fixed frame structure of a sunroof for vehicles and the movable closure panel therefor, wherein said frame structure includes a peripheral sealing member, said combination comprising:

a fixed frame structure defining an opening and including a peripheral channel disposed therein;

a movable closure panel hingedly attached to said frame structure;

a releasable hinge member secured to the underside of said panel, said hinge member having a hinge body and an ex-

tended flexible tongue member adapted to bend and twist along the length thereof;

a coupling means mounted in said peripheral channel of said frame structure and adapted to releasably receive said flexible tongue member therein; and

means slidably mounted to said hinge body to lockingly engage said tongue within said coupling means.

4,428,156

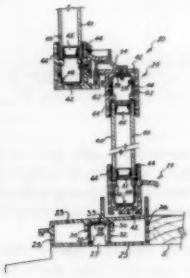
REINFORCED WINDOW ASSEMBLY

Douglas N. Maim, and James D. Hall, both of South Bend, Ind., assignors to Mastic Corporation, South Bend, Ind.

Filed Oct. 2, 1981, Ser. No. 307,897

Int. Cl.³ E06B *3/00*

U.S. Cl. 49—501 **7 Claims**



1. In combination, a sash assembly and a glazing panel, said sash assembly including sash members forming frame means for holding said glazing panel about its periphery, the improvement wherein at least one sash member has a base and spaced side walls extending from said base to define an open channel to the base, said side walls having opposed inner faces, retainers extending into said channel from said side wall inner faces, a rigid support member fitted between said side wall inner faces within said channel and interlocking with said retainers to provide rigidity to said spaced side walls, said glazing panel being positioned between said side walls and supported by said one sash member in a spaced relationship from said rigid support member.

4,428,157

DOOR ESPECIALLY FOR MOTOR VEHICLES

Ernst Engelsberger, Glonn; Ralf-Thilo Schulz, Putzbrunn, and Franz Drachenberg, Baldham, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

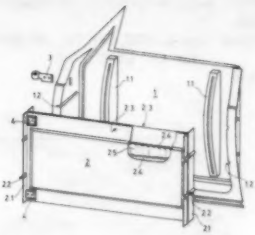
Filed Dec. 28, 1981, Ser. No. 334,640

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102329

Int. Cl.³ B60J *5/04*

U.S. Cl. 49—502 **7 Claims**

1. A door especially for a motor vehicle, comprising an interior door means, and a central shearing stress and torsion load resistant core member of hard foam material having a larger surface area relative to said interior door means, two shells encasing said central core member, at least one impact energy absorbing element embedded in said central core member of hard foam material, and means operatively securing said central core member to said door means, whereby the central



core member extends substantially from one edge of the door to the opposite edge of the door.

4,428,158

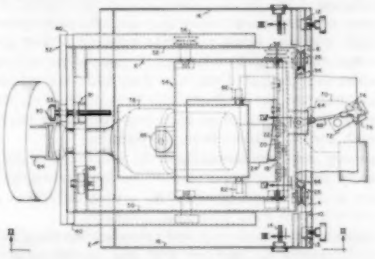
METHOD AND APPARATUS FOR GRINDING IRREGULAR SURFACES

James J. Fatula, Sr., Ellwood City, Pa., assignor to Ryman Engineering Company, Ellwood City, Pa.

Filed Jun. 24, 1981, Ser. No. 276,792

Int. Cl.³ B24B *7/02*

U.S. Cl. 51—33 R **8 Claims**



1. A portable grinder for grinding an elongated workpiece having an irregular cross section which comprises a base adapted to be secured on or adjacent the workpiece, a longitudinal track on said base adjacent the rear thereof, a pair of longitudinally spaced apart stops mounted on said base adjacent said track; a carriage mounted on said base for longitudinal movement thereon, rotatable rolls on said carriage adjacent its rear supported on said track, a rotatable follower roll mounted on the front end of said carriage and adapted to contact the top surface of said workpiece, the axes of all of said rolls being transverse to the longitudinal track, said carriage including spaced apart transverse side walls, a guide track holder slidably mounted on the outside of each side wall in opposed relationship for movement toward and away from said longitudinal track, a guide mounted in each holder, each guide including top and bottom horizontal rear sections and top and bottom front sections extending upwardly and forwardly at an angle from the means connecting said track holders, means for moving said track holders, a horizontal guide on the inside of each side wall in opposed relationship with the associated rear sections; means for moving said carriage along said longitudinal track including a reversible motor, a control for said reversible motor including a pair of longitudinally spaced apart switches mounted on the rear of said carriage and having a part adapted to contact the associated stop, means operated by each switch when actuated by contact with its associated stop to reverse rotation of said reversible motor whereby said carriage reciprocates between the limits set by said stops; a trolley mounted on said carriage for transverse

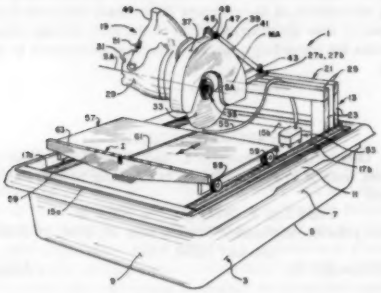
movement with respect to said base, said trolley including a pair of forward rolls and a pair of rearward rolls with the forward rolls being received in said first named guide tracks and the rearward rolls in said horizontal guides, a shaft mounted on said trolley adjacent its rear with its axis extending parallel to the longitudinal track, a grinder motor pivotally mounted on said shaft, a grinding wheel driven by said grinder motor and extending forwardly a substantial distance beyond said follower roll, and means for reciprocating said trolley in said guide tracks.

4,428,159

PORTABLE, DIRECT DRIVE ABRASIVE SAW

John D. Sigetich, 2127 Gladiator, Fenton, Mo. 63026, and Karl B. Schweickhardt, 23 W. Meadow, St. Louis, Mo. 63011

Filed Jul. 29, 1981, Ser. No. 287,931
Int. Cl.³ B24B *7/02*
U.S. Cl. 51—92 R **7 Claims**



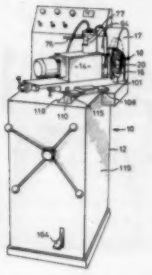
1. A portable, direct drive abrasive saw for cutting ceramic tile, bricks, masonry blocks, metal, refractory material, or other similar work comprising a base pan constituting a coolant reservoir, a frame secured to said pan, said frame including a pair of generally parallel, spaced rails extending horizontally of the pan when said saw is in its normal operating position, a saw support, a unitary, direct drive abrasive saw mounted on said saw support in a cutting position, said saw including an electric motor haing an axis of rotation, a rotary abrasive saw blade with the rotary axis of said saw blade being coaxial with the rotary axis of said motor, means for directly interconnecting said motor to said blade for rotatably driving said blade, a table reciprocably mounted on said rails supporting said work to be cut and being movable in a generally horizontal direction toward and away from said saw blade from a retracted position in which said table and the work thereon is clear of said saw blade and a cutting position in which said saw blade cuts through said work as the latter is moved past said saw blade, and a coolant pump for circulating coolant from within said base pan to said saw blade as the latter cuts through the work, said saw support including at least one horizontal frame member extending transversely of said rails above the level thereof at one end of said frame, said at least one horizontal frame member being rigidly secured relative to said frame, and means cantilevered from said at least horizontal frame member and extending from one end of the frame back toward the other end thereof in a direction generally parallel to said rails for mounting said unitary direct drive abrasive saw, said direct drive saw including said motor and said abrasive saw blade being pivotably mounted on the free end of said cantilevered support means for rotation about a second axis generally parallel to and eccentrically offset from the rotary axis of said saw blade thereby to selectively permit the raising and lowering of said saw blade relative to said table, and means for locking said saw at a desired height.

4,428,160

CENTERLESS VALVE GRINDING

Bernardus A. Willemsen, Sebright, and Ray G. Parnham, Orillia, both of Canada, assignors to Ingenious Devices Limited, Orillia, Canada

Filed Oct. 22, 1979, Ser. No. 87,417
Int. Cl.³ B24B *15/00*
U.S. Cl. 51—129 **7 Claims**



1. A valve grinding apparatus, comprising:

a grinding wheel having an axis and means for driving the grinding wheel,

two base rollers in side-by-side relation with parallel axes,

drive means for positively driving the base rollers in the same direction so that the surface speeds of the base rollers are the same,

a control roller centered above the base rollers, with the axis of the control roller in a plane parallel to the plane containing the axes of the base rollers,

control means (a) for selectively raising and lowering the control roller with respect to the base rollers, and (b) for selectively varying the angle of the control roller axis in said parallel plane, such that the control roller can be angled to both sides of a central position in which the axis of the control roller is parallel with the axes of the base roller,

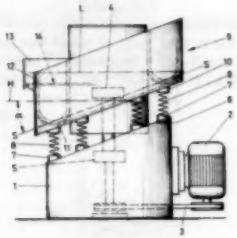
support means spaced from the base rollers for supporting the region of a valve stem adjacent the valve to be ground, while a region of the valve stem more remote from the valve contacts the base rollers, the support means being generally between the grinding wheel and the base rollers, whereby the valve stem extends parallel to the base roller axes, said support means including means defining a V-shaped groove of which the flanks are stationary and have the same curvature as the respective base rollers, said support means further including a hold-down member supported above the apex of the groove for vertical movement, and means for urging the hold-down member downwardly against a valve stem supported in the groove,

and stop means for establishing the maximum permitted valve stem movement in the direction from the support means toward the base rollers, said direction being the rearward direction.

4,428,161
ANNULAR TROUGH-SHAPED VIBRATING SCOURING CONTAINER

Carl K. Walther, Wuppertal; Hubert P. Hagelüken, Düsseldorf, and Karl Temme, Wuppertal, all of Fed. Rep. of Germany, assignors to Carl Kurt Walther GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,926
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979,
Int. Cl.³ B24B *31/06*
U.S. Cl. 51—163.2 **13 Claims**



1. In an annular trough-shaped vibrating abrasive container for abrasive finishing of workpieces in the container, the abrasive container being resiliently mounted on a machine frame, the container comprising upwardly directed lateral walls defining a container channel, the container therebetween, with an ascending bottom section and a descending bottom section of the channel which ascends and descends respectively in the peripheral direction of the container channel in a downstream direction in which the contents of the container are conveyed, the contents moving along the ascending bottom section in a spiral path, the improvement wherein

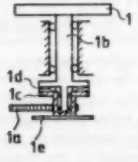
the descending bottom section extends over an angle of substantially 180° of the container channel, and

said lateral walls of the container channel in the area of a lowermost portion of the bottom sections of the container channel defining a lowermost beginning of said container channel, extend upwardly higher than an uppermost portion of the bottom sections of the container channel defining an uppermost apex of the bottom sections of said container channel.

4,428,162
GRINDING MACHINE AND CONTROL FOR REMOVING BURRS OR FINS FROM WORKPIECES SUCH AS CASTINGS

Wolfgang Feldt, Grundau, and Walter Bautz, Darmstadt, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 172,090, Jul. 25, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,226
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930309
Int. Cl.³ B24B *49/16*
U.S. Cl. 51—165.77 **20 Claims**

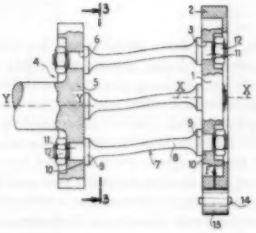


1. In a grinding assembly for grinding off the molding fin from a rough casting on which the fin extends in a plane substantially at right angles to the surface of the casting, the combination comprising a grinding wheel having a rotary drive for rotating it at a reference speed, means including a carriage for mounting the grinding wheel for bodily relative movement in feed and return directions, means including a jig for mounting the casting in front of the grinding wheel, feed driving means for driving the carriage in the feed direction at a reference feed rate so that the grinding wheel grinds away the fin as it proceeds toward the surface of the casting, means for constantly measuring the load imposed upon the rotary drive and for producing an output signal which is a function of the load and which sharply increases in magnitude as the surface of the casting is encountered at the base of the fin, feed shut-off means for shutting off the feeding movement of the carriage, means responsive to the magnitude of the output signal for triggering the feed shut-off means to the shut-off condition upon sudden increase of the output signal indicating that the engaged portion of the fin has been removed and that the surface of the casting is being encountered, the shut-off means inhibiting the feeding movement of the carriage in the feed direction for a time greater than the response time of the feed driving means and means for imparting relative traversing movement to the casting.

4,428,163
SHAPING MACHINE

Gerard Deschatrettes, Guecellard, and Rene Tirel, Pont de Gennes, both of France, assignors to Glaenzer Spicer, Poissy, France

Filed Sep. 9, 1981, Ser. No. 300,980
Claims priority, application France, Sep. 29, 1980, 80 20807
Int. Cl.³ B25B *5/00*
U.S. Cl. 51—237 M **8 Claims**



1. A shaping machine comprising:

a rotary spindle adapted to be rotated about an axis of rotation thereof by a motor;

a workpiece carrying plate extending perpendicular

means for maintaining a workpiece to be shaped in a position coaxial with said plate;

connection means for connecting said plate to said spindle, such that rotation of said spindle causes rotation of said plate and the workpiece to be shaped;

a cam mounted about the periphery of said plate and rotatable therewith, said cam having a shape proportional to a shape to be imparted to the workpiece by a shaping tool;

means for biasing radially said cam and said plate during rotation thereof; and

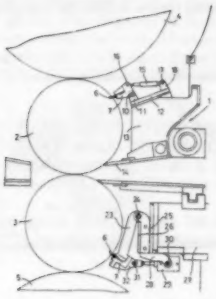
said connection means comprising a plurality of radially resiliently yieldable struts extending parallel to said rotation axis and spaced about said rotation axis, each said strut having opposite end portions rigidly fixed without relative axial displacement to said spindle and to said plate, said plurality of struts thereby forming means for fixing the axial distance between said spindle and said plate, for transmitting rotation of said spindle to said plate, and for enabling radial displacement of said plate with respect to said rotation axis of said spindle.

4,428,164

APPARATUS FOR THE CONTINUOUS POLISHING AND THE UNIFORM COOLING OF THE FACE OF A ROLLING MILL WORK ROLL MOUNTED IN ITS STAND

Pierre G. Dantinne, Seraing, Belgium, assignor to Cockerill Sambre, Belgium

Filed Dec. 17, 1980, Ser. No. 217,384
Claims priority, application Belgium, Dec. 27, 1979, 198771
Int. Cl.³ B24B 5/00
U.S. Cl. 51—252 1 Claim



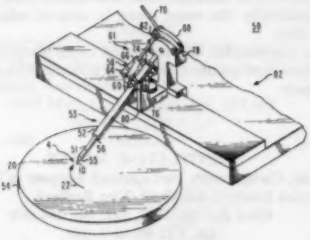
1. In an apparatus for the continuous polishing and uniform cooling of the face of a rolling mill work roll mounted in its stand, the improvement of at least one abrasive rubbing element, the rubbing element being mounted on a retractable support extending parallel to the axis of rotation of a lower roll and with the rubbing element extending over the entire length of the roll face, and which is adapted to be applied against the face of the roll as it rotates, the abrasive rubbing element being comprised of a plurality of abrasive sheets which are superposed and clamped against one another in their housing on the support, the support and the abrasive rubbing element being associated with the lower roll and being mounted on two lateral rockers, the rockers being pivoted about two coaxial lateral pivots fixed relative to an outlet table, pneumatic cylinders having rods pivotably connected to the support for controlling displacement of the rods and providing the pressure applied to the rubbing element against said roll, the bodies of said pneumatic cylinders having two coaxial lateral journals and being pivoted relative to the outlet table on said journals, the pneumatic cylinders providing means for exerting a predetermined pressure to the abrasive rubbing element for enabling cooling water to be entrained along the face of the roll during rotation to form a longitudinal cushion of water making the temperature of the face substantially uniform over its length, while the abrasive rubbing element also operates to smooth the roll face and removes oxide incrustrations therefrom, wherein the support for the abrasive rubbing element is in the form of an angle member, said rubbing element being situated in prolongation of one of the flanges of said angle member, wherein the support comprises a second abrasive rubbing element formed of said plurality of sheets extending over the entire length of the face of the roll, characterized by the support of the second abrasive rubbing element being associated with an upper roll, the support being pivotal about coaxial lateral pivots which are fixed relatively to the upper portion of the stand frame, pneumatic cylinders also providing the pressure applying said rubbing element against said upper roll, said pneumatic cylinders for cooperating with the upper roll being connected by their rods to the support, the cylinders having their bodies mounted on coaxial lateral pivots, and wherein the pivots allowing articulation of the support of the second abrasive rubbing element and the pneumatic cylinders are mounted on a common plate, the plate being held fast to the frame.

4,428,165

FLIP-FLOP GRINDING METHOD

Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,284
Int. Cl.³ B24B 1/00
U.S. Cl. 51—283 R 5 Claims



1. A method for preparing a capacitive electronic disc playback stylus from a dielectric element having a cone shaped tip comprising a dielectric material wherein the method comprises the steps of:

(a) a lapping an electrode surface in the tip;

(b) contacting a first region of the tip wherein a first flat is lapped with an abrasive lapping surface by a holding device capable of being rotated about an axis extending through the tip region;

(c) rotating the element to a second region wherein a second flat is lapped by rotating said holding device by a flipping lever guided in a pre-determined arc;

(d) applying a predetermined biasing force to said flipping lever by means of a flexible fork assembly drivingly connected to said flipping lever;

(e) contacting the second region of the tip wherein the second flat is lapped with the abrasive lapping surface;

(f) repeating steps (b)-(e) until the two flats have been lapped to substantially the same dimensions; and

(g) lapping the region at the tip end to form a disc engaging structure of the desired shape;

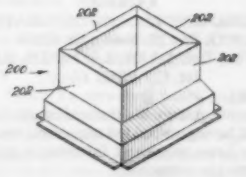
wherein the duration for step (b) and step (e) are substantially equal, wherein the duration of step (c) is small compared to the durations of steps (b) and (e).

4,428,166

ROOF CURB AND LINEAR CURB FORM HAVING INNER AND OUTER SUPPORTING WALLS

George L. Burghart, 2993 Curtiss, Des Plaines, Ill. 60018

Filed Aug. 17, 1981, Ser. No. 293,373
Int. Cl.³ E04B 7/18; E04D 13/03
U.S. Cl. 52—19 13 Claims



1. A double wall roof curb linear form fabricated from a continuous strip of metal of substantially uniform thickness comprising:

a. a top member extending the length of the linear form and having an inner edge and an outer edge,

b. an inner portion comprising an inner wall at said inner

edge bent downwardly transverse to said top member and a bottom member bent inwardly from the bottom of said inner wall parallel to said top member and spaced from said top member, and

c. an outer portion at said outer edge having a first part bent downwardly transverse to said top member, a second part bent laterally outwardly and downwardly from said first part and a third part bent outwardly parallel to said top member, said third part and said bottom member lying in substantially the same plane in spaced relation to one another,

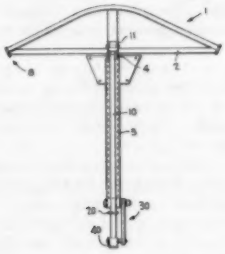
d. said top member and inner and outer portions forming a hollow configuration shaped to accommodate an insulant therein.

4,428,167

VENTILATING MEANS

Alan Reay, Christchurch, New Zealand, assignor to The Fletcher Industries Limited, Auckland, New Zealand

Filed Jul. 16, 1981, Ser. No. 284,000
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—72 **8 Claims**



1. A ventilating device comprising: at least one ventilating section; an elongated housing extending in a direction away from said section; a support arm slidably engaged within said elongated housing; means for engaging one end of said support arm with said section; an actuating arm connected to said support arm; means for linking said actuating arm to said elongated housing; and a flange on the actuating arm adjacent the end of said housing remote from said section; the arrangement being such that a predetermined movement applied to said actuating arm causes the support arm to slide outwardly of the elongate housing to move the ventilating section into a ventilating position; and the actuating arm it its position of rest, wherein the support arm is withdrawn within the elongate housing and the ventilating section is in a substantially non-ventilating position is held in such position by the flange engaging with said remote end of said elongate housing.

4,428,168

PERMANENT FLORAL DECORATION

Rex F. Tomer, P.O. Box 75, Ewing, Ill. 62836

Filed Dec. 1, 1981, Ser. No. 326,382
Int. Cl.³ E04H *13/00*
U.S. Cl. 52—104 **12 Claims**

1. A permanent substantially transparent marker installed in the ground and having embedded mementos, aesthetic decorations and other items, as desired, for use as a grave marker or the like, said marker comprising:

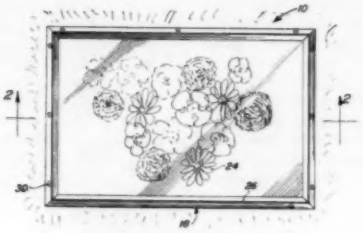
container means;

support means within said container means, said support means being of a resilient and insulating construction;

viewing means of a substantially solid and transparent construction, said viewing means being within said container means and being substantially supported by said support means, said viewing means having at least one of said mementos, aesthetic decorations and other items embedded therein, said at least one of said mementos, aesthetic decorations and other items being viewable from a position external to said container means;

threshold means securing said viewing means within said container means, the threshold means including structural means overlying a rim portion of the container means and overlapping a peripheral portion of an upper surface of the viewing means; and

fastener elements inserted into the threshold means from above, the fastener elements extending through the threshold means into the container means thereby securing the viewing means within the container means;



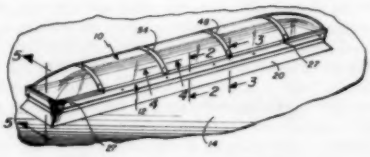
the threshold means being substantially flush with the ground level and protecting the upper surface of the viewing means from lawn mowing operations and the like, the support means serving to permit an expansion and contraction of said viewing means within said container means, thereby to prevent damage thereto during external environmental temperature changes, and further serving to insulate said viewing means from said external temperature changes, thereby to substantially reduce said expansion and contraction of said viewing means.

4,428,169

VAULTED DOME SKYLIGHT

Nicholas G. Tsakiris, South Berwick, Me., assignor to Wasco Products, Inc., Sanford, Me.

Filed Mar. 1, 1982, Ser. No. 353,048
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **6 Claims**



1. A vaulted dome skylight for covering an opening defined by a support curb and comprising:

a single piece sill extending about all sides of the support curb,

means securing the single piece sill to the support curb,

an inner dome means having opposite end flanges,

an outer dome means having opposite end flanges,

a retaining means for securing the domes over the sill including an end retainer one at each end of the sill having one leg secured to the sill and a second horizontally disposed leg contacting and overlying the dome end flange,

said sill having a horizontally disposed base secured to the curb frame and inner and outer angularly disposed channel members for respectively receiving said inner and outer domes along the sides thereof,

said inner and outer dome means each comprising a plurality of dome sections with only the end ones thereof having said end flange,

at least one intermediate support rib for supporting adjacent dome sections and extending substantially normal to the sill sides,

a cap band secured over and to said support rib,

a first gasket means disposed at said support rib and between said dome means,

a support member and means securing the support member to the sill to maintain the support member in a position to hold the intermediate support rib in place,

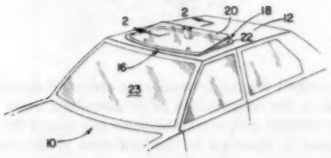
and a second gasket, one disposed at each end of the sill, arranged intermediate the outer channel member of the sill and the underside of the inner dome end flange.

4,428,170

COMBINATION FRAME STRUCTURE AND FASTENING DEVICE FOR VEHICLE SUNROOFS

Ronald E. Wooten, Sunnymead, and Gerald A. Kwan, Pasadena, both of Calif., assignors to Le Van Specialty Co., Inc., City of Industry, Calif.

Filed Oct. 5, 1981, Ser. No. 308,392
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—217 **12 Claims**



1. In combination, a frame structure and fastening device for sunroofs to be mounted in an opening formed in a vehicle roof, wherein the combination comprises:

a substantially rectangular frame structure defining an access opening, said frame structure being formed having a vertical jamb wall, a peripherally disposed support-flange member integrally formed at the upper end of said jamb wall to engage said vehicle roof;

a first channel member coextensively formed in said frame structure adapted to receive a sealing member therein, and positioned inwardly of said access opening thereof; and

a second channel member formed contiguously with said first channel member;

said first channel member being defined by the upper portion of said jamb wall having an inwardly extending edge member and a laterally extending intermediate wall member, and means formed in said edge member and said intermediate wall member to secure said sealing member in said first channel member;

said second channel member being defined by the lower portion of said jamb wall having an inwardly extending bottom wall;

a cantilevered clamping bar adapted to be secured to said frame structure;

wherein said clamping bar comprises:

a vertical wall defining a truss member,

a lower horizontal wall member integrally formed with said vertical wall, to establish the substantially "L"-shaped, cross-sectional configuration of said clamping bar,

pivot means formed on said clamping bar for pivotal engagement with said frame structure,

said pivot means comprising a pivotal strut member formed longitudinally along one edge of said clamping bar, and positioned to pivotally engage said frame structure, and

means on said clamping bar for fastening said clamping bar to said frame structure to cause said clamping bar to pivot to a clamping position against said vehicle roof, whereby said vehicle roof is fixedly secured between said support flange and said clamping bar,

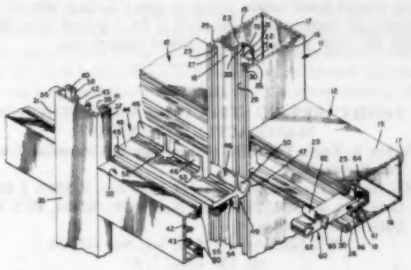
said means for fastening said clamping bar to said frame structure comprising a securing track formed in said lower horizontal wall of said clamping-bar member.

4,428,171

THERMAL STOREFRONT SYSTEM

Lawrence S. Harbin, Riverdale, Ga., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 12, 1982, Ser. No. 357,407
Int. Cl.³ E04B *1/62*
U.S. Cl. 52—398 **17 Claims**



1. A window structure for a commercial building or the like wherein a plurality of rectangular glass panels are supported in a common plane by a plurality of spaced mullions and a plurality of horizontal supports connected between said mullions, the improvement therein of each of said horizontal supports including a recess extending along its length, at least one support clip including a support tongue and a setting block shelf including an upper surface extending approximately in a horizontal plane from said horizontal support,

said support tongue including a base portion extending outwardly from said setting block shelf at a level lower than said setting block shelf, and a flange portion extending angularly upwardly from said base portion to the level of said setting block shelf and received in said recess, and

said glass panels being supported at their lower edges in abutment with said mullions and horizontal supports by the setting block shelf of some of said support clips.

4,428,172

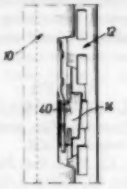
FASTENING DEVICE FOR SCREEN OR WALL PANELS

Olof Larsson, Långsjövägen, Sweden, assignor to R. O. L. Inredningar AB, Stockholm, Sweden

Filed May 29, 1981, Ser. No. 268,521
Claims priority, application Sweden, Jun. 5, 1980, 8004222
Int. Cl.³ E04B *2/82*
U.S. Cl. 52—489 **4 Claims**

1. Fastening device for mounting panel means to vertical support rails having inner and outer sufaces with openings therethrough which openings are defined by upper and lower walls comprising a generally U-shaped plate means having a central rib portion and a pair of generally parallel shank means which extend outwardly from opposite ends of said central rib portions, first and second hook means extending from the upper and lower portions of each of said shank means so as to be in spaced relationship to said central rib portion so that said hook means are selectively engaged through the opening in the support rails to the support rail, each of said first hook means having a projection along the length thereof which extends towards and is in spaced relationship to said central rib portion

whereby the said fastening device is mounted to the vertical support rail with said projections engaging the upper walls defining an opening in the vertical support rail with said first



and second hook means engaging inner surface thereof said central rib means will be disposed in fixed spaced relationship with the outer surface of the vertical support rail.

4,428,173

LOAD CARRYING STRUCTURE AND METHOD OF MANUFACTURE THEREFOR

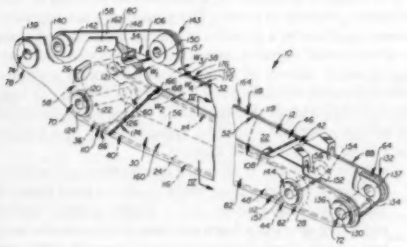
Harvey A. Knell, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00398, § 371 Date Apr. 9, 1980, § 102(e) Date Apr. 9, 1980, PCT Pub. No. WO81/02884, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 9, 1980, Ser. No. 245,236

Int. Cl.³ E04C *3/30*

U.S. Cl. 52—731 **22 Claims**



1. A load carrying structure (**10**), comprising:

top and bottom plates (**22,24**) each having first and second edge portions (**50,52;54,56**) and first and second end portions (**38,46,40,48**);

first and second side plates (**30,32**) connected to said first and second edge portions (**50,54;52,56**), respectively, of both of said top and bottom plates (**22,24**) and each extending outwardly from and adjacent said first end portions (**38,40**) of said top and bottom plates (**22,24**), said outwardly extending portions (**78,80**) of said first and second side plates (**30,32**) being spaced one from the other;

first and second support members (**26,28**) each having first and second side portions (**58,60;62,64**) and first and second end portions (**34,36;42,44**), said first support member (**26**) being connected at its first and second end portions (**34,36**) to said first end portions (**50,52**) of said top and bottom plates, respectively, and at its first and second side portions (**58,60**) to said first and second side plates (**30,32**), respectively, said second support member (**28**) being connected at its first and second end portions (**42,44**) to said second end portions (**46,48**) of said top and bottom plates (**22,24**), respectively, and at its first and second side portions (**62,64**) to said first and second side plates (**30,32**) respectively; and

at least first, second and third preselected load input locations (**70,72,74**), said first and second load input locations (**70,72**) each being defined on said first and second side plates (**30,32**) and with said first and second support members (**26,28**), respectively, said third load input location (**74**) being defined on said outwardly extending portions (**78,80**) of said first and second side plates (**30,32**).

4,428,174

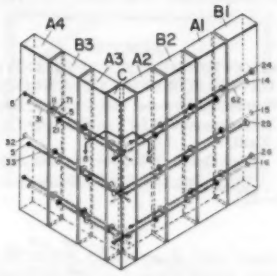
CONSTRUCTION SYSTEM

Clyde C. Grady, II, 25 Pelham Rd., #188, Greenville, S.C. 29615

Filed Apr. 4, 1979, Ser. No. 27,028

Int. Cl.³ E04C *3/10*

U.S. Cl. 52—741 **3 Claims**



1. A method for the formation of arrays of modular units such that in the construction of an assembled array of more than one modular unit contact between any two of the modular units placed in abutment in the formation of the array is restricted to the contact of three load distributing surfaces comolded on the first modular unit of the aforesaid two modular units with three load distributing surfaces comolded on the second of the aforesaid two modular units, wherein each modular unit of the aforesaid two modular units is connected to the other modular unit of the aforesaid two modular units by means of bolts or other connectors, where said bolts or other connectors pass through parallel apertures in each of the aforesaid two modular units, wherein said apertures are arranged into more than one group of at least two apertures to a group such that all aforesaid apertures in a first group of the aforesaid groups lie in a plane which is parallel to the plane formed by any second group of apertures, Wherein at least one aperture, designated as the first aperture, in each group of apertures is provided with a fastening means such as an internally threaded nut which is attached to either of the aforesaid two modular units such that a bolt or other means of connection may be passed through the aforesaid first aperture and fastened to the aforesaid fastening means.

4,428,175

ENERGY FREE LOADER

Gordon W. Haab, Richmond, Va., assignor to G. W. Haab Co., Inc., Richmond, Va.

Filed Jun. 16, 1982, Ser. No. 388,895

Int. Cl.³ B65B *5/10, 21/16, 43/62*

U.S. Cl. 53—55 **1 Claim**

1. In a case loader for containers comprising in combination:

(a) a container loading station for attachment to the end of a conveyor, said container loading station holding a case load of containers in a single column;

(b) a case loading station above a case conveyor for transporting cases to and away from the case loading station;

(c) said case loading station located beneath and to one side of the container loading station;

(d) a plurality of container slides between the bottom of the container loading station and the case loading station;

(e) said container slides each beginning at the position of

different containers and each ending at different container positions at the case loading station;

(f) a first stop means to hold the column of containers in position when the case load of containers has been conveyed to the container loading station;

(g) an inclinded bar leading from beneath the case conveyor to above the case loading station to tilt the cases as they approach the case loading station;

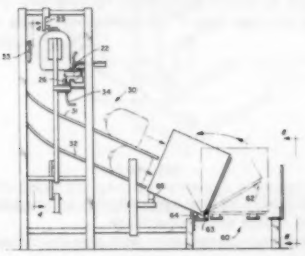
(h) means to hold the case in a titled position at the case loading station;

(i) a second stop means to hold the container in the case loading station until it has been loaded with containers; the improvement comprising:

(j) a pivoted container support in the bottom of the container loading position, said support holding said containers when in the horizontal support position and allowing said containers to fall by gravity when in the released position;

(k) a counterweight biasing said container support into the support position, said counterweight being overcome by the weight of a case load of containers;

(l) said container support, when in the support position, resting upon a movable support plate, which in the first position holds said container support in the support position and in the second position allows said container support to pivot to said released position;



(m) a lever arm to which the support plate is attached, allowing said support plate to pivot from the first position to the second position;

(n) a counterweight biasing said lever arm to said first position;

(o) a mechanical container sensor in said case loading station, said mechanical container sensor being activated by the leading container when slid into its position by the other containers in the container loading station;

(p) said mechanical container sensor biasing said lever arm into the second position overcoming the counterweight;

(q) a latch connected to said lever arm preventing said lever arm from moving from the first position to the second position;

(r) a mechanical case sensor which is tripped when a case reaches the case loading station;

(s) said mechanical case sensor withdrawing said latch when the case is in position;

whereby, when both the containers and case are in position, the lever arm moves, the container support pivots, and the containers fall into the case.

4,428,176

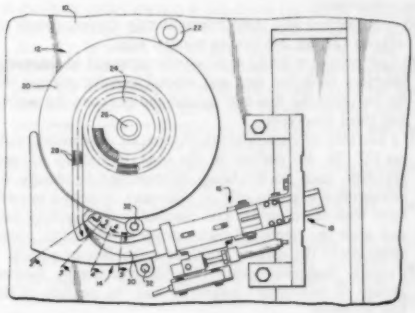
REEL CLIP FEED SYSTEM

William E. Burrell, Inman, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Aug. 12, 1981, Ser. No. 292,086
Int. Cl.³ B65B *51/05*
U.S. Cl. 53—138 A **3 Claims**

1. In a packaging machine of the type wherein the package is clipped closed using "U" shaped clips each having a cross piece portion and a pair of legs extending from the ends of the cross piece substantially parallel to each other, each said clip being adapted to close and seal a package by having said legs folded over towards each other and over the opening of the package between the clip's cross piece and the folded over legs, said machine including a clipping station having means to accept said clips when they are in a predetermined orientation and to clip said packages closed thereat, said clips being arranged in a flat coil wherein the clips are joined to each other by tape means at their respective cross pieces so that their legs extend radially outwardly of the coil center, rotatable reel means on said machine for carrying said coil of clips, means to turn the line of clips unreeling from said reel from their coiled orientation to said predetermined orientation required at said clipping station, the improvement which comprises:

(a) enclosed track means having a cross-sectional area of a size and shape to snugly receive, hold, and guide said line of clips, said track means being defined by a "U" shaped channel having upright wall means and a bottom wall connecting said upright wall means, an opening at the top between said upright wall means and a lid member hinged to said channel at one longitudinal end thereof to cover said top opening of said channel, said line of clips progressing through said channel with their cross piece at the bottom thereof on said bottom wall;



(b) spring loaded rachet finger means extending through an opening in said upright wall means and into driving contact with said line of clips,

(c) means to move said rachet finger means to and from along the line of motion of said clips through said track, said rachet finger means being mounted on said moving means so that said finger means drives said line of clips towards said clipping station and does not move said line of clips when said moving means moves said finger means away from said clipping station; and,

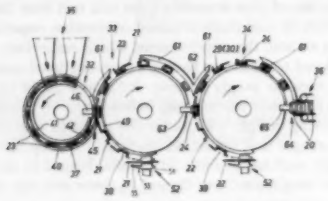
(d) spring means mounted on said lid member above said track means and pointing towards said clipping station, whereby said line of clips moves easily towards said clipping station by sliding along said spring means and are restrained by contact with said spring means against motion away from said clipping station, and,

(e) said spring means extending downwardly from said lid in the closed position of said lid between the legs of said clips to contact the top surfaces of said clip cross pieces.

4,428,177
CIGARETTE PACKAGING APPARATUS WITH RADIAL TRANSFER

Heinz H. Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Nov. 25, 1980, Ser. No. 210,186
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949252
Int. Cl.³ B65B *11/28*
U.S. Cl. 53—170 **7 Claims**



1. An apparatus for packaging rod-shaped objects such as cigarettes into quadratic packs having relatively wide front and rear faces and a relatively narrow width on side and end faces, comprising:

(a) first, second and third intermittently driven, rotary revolvers (**32**, **33**, **34**) having parallel axes,

(b) said revolvers being sequentially arranged in tangential interface to define first and second transfer stations (**45**, **62**) between the first and second and between the second and third revolvers,

(c) a plurality of circumferentially spaced, threesided pockets (**37**, **38**, **39**) defined in the outer periphery of each revolver, each pocket being dimensioned to closely accommodate a group (**23**) of cigarettes arranged in pack form with the cigarette axes parallel to the revolver axes and with the depth of each pocket substantially corresponding to the narrow width of a side face of a pack,

(d) supply magazine means (**35**) for individually feeding groups of unwrapped cigarettes into the pockets of the first revolver,

(e) means (**52**) adjacent the second revolver upstream from the first transfer station for individually inserting inner metallic foil blanks (**21**) into the pockets of the second revolver,

(f) first radially reciprocable ejector means (**46**) disposed at the first transfer station for individually pushing unwrapped cigarette groups from pockets of the first revolver into tangentially facing foil blank lined pockets of the second revolver while said revolvers are stationary,

(g) a pair of coplanar plates (**93**) axially movable relative to each other and disposed at the first transfer station on opposing sides of said first revolver for contacting and supporting only a free, relatively wide outer face of an unwrapped cigarette group disosed in a pocket of the first revolver at said transfer station, said plates being radially spaced from and movable in unison with the ejector means to maintain contact with and thereby retain the unwrapped cigarette group intact during transfer, said plates lying parallel to said cigarette group face and not engaging the axial ends of the cigarettes in the group during transfer,

(h) means for axially and radially moving said supporting plates at said first transfer station,

(i) means disposed adjacent the outer periphery of the second revolver and between the first and second transfer stations for folding the foil blanks around the cigarette groups,

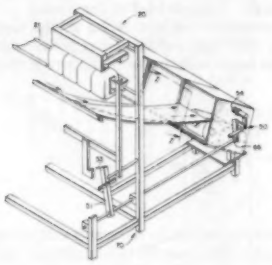
(j) means adjacent the third revolver upstream from the second transfer station for individually inserting outer paper blanks (**22**) into the pockets of the third revolver, and

(k) second radially reciprocable ejector means (**63**) disposed at the second transfer station for individually pushing foil wrapped packs from pockets of the second revolver into tangentially facing paper blank lined pockets of the third revolver while said revolvers are stationary, whereby the radial travel of the cigarette groups and packs at the first and second transfer stations, respectively, is minimized to thereby enable more rapid transfer.

4,428,178
ENERGY FREE LOADER

Joseph H. Burtoft, 3522 Albrecht Ave., Akron, Ohio 44312

Filed Jun. 4, 1982, Ser. No. 384,956
Int. Cl.³ B65B *5/10, 21/10, 43/62*
U.S. Cl. 53—475 **2 Claims**



2. The method of loading a plurality of containers into a case at a packing station which comprises:

(a) loading the packing station with a single column of containers from a container conveyor;

(b) sensing when the case load of containers is in the packing station;

(c) placing a plurality of cases in an inclined case loading position at the packing station, beneath and beside said column of containers;

(d) sensing when the cases are in the inclined case loading position;

(e) when the two sensors detect a case load of containers and the cases, dropping the containers;

(f) guiding each container along an inclined chute from its first position to its position in the case

whereby containers are loaded into cases by a loader without the use of powered components.

4,428,179
CHICKEN WEIGHING APPARATUS

C. Wane Jordan, and John W. Walker, both of Macon, Mo., assignors to Banquet Foods Corporation, Macon, Mo.

Filed Nov. 30, 1981, Ser. No. 325,828
Int. Cl.³ G01G *19/04;* **B65B** *57/00*
U.S. Cl. 53—502 **10 Claims**

1. A device for filling a package with a predetermined weight of irregularly shaped, different sized items comprising:

computation means;

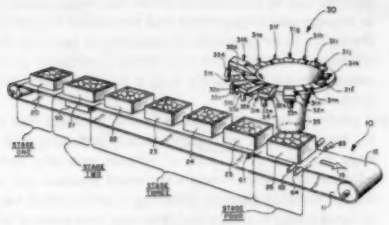
first weighing means for passing to said computation means information relating to the weight of a first quantity of items in said package, said weight of said first quantity of items being less than said predetermined weight;

a guide funnel having an upper rim and a lower opening;

a plurality of holding means, each adapted to support one additional item for subsequent passage to said package upon receipt of a control signal, said holding means disposed around the upper rim of the guide funnel such that each of the holding means is symmetrically placed with respect to the lower opening;

second weighing means for passing to said computation means information relating to the weight of the additional items adapted for passage to said package from each of said holding means;

said computation means passing a control signal only to a



selected subset of said holding means whose items, when combined with said first quantity of items in said package, most nearly equals said predetermined weight, thereby causing the items of the selected subset of the holding means to travel through the funnel and out the lower opening.

4,428,180

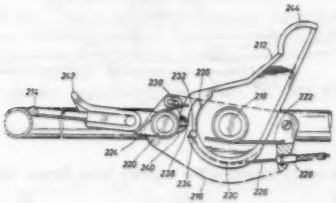
LAWN MOWER AND CONTROLS THEREFOR

John A. Carlson, Conroe, Tex., assignor to Capro, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 230,607, Feb. 2, 1981, which is a continuation-in-part of Ser. No. 157,374, Jun. 9, 1980, Pat. No. 4,309,862. This application May 19, 1982, Ser. No. 379,764

Int. Cl.³ A01D *69/10*

U.S. Cl. 56—11.3 **17 Claims**



1. A lawn mower control system comprising

a housing,

fastening means for mounting the housing on a lawn mower handle,

a control lever pivotally mounted within the housing and extending therefrom,

a cam pivotally mounted in the housing with said control lever and having a resilient finger,

said control lever and said cam having interengaging shoulders so that movement of said control lever in one direction rotates said cam,

means on said cam for attaching a control line thereto so that rotation of said cam moves the control line, and

a deadman lever pivotally mounted in said housing and having a shoulder,

the shoulder on said deadman lever engaging the resilient finger on said cam to retain said cam in operating position as long as said deadman lever is held in operating position.

4,428,181

MOWING DEVICE

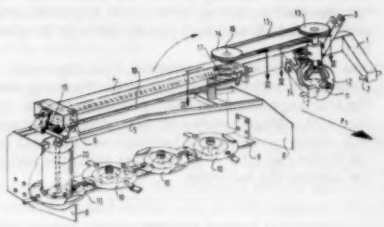
Hendrikus C. van Staveren, Nieuw-Vennep, and Nicolaas Prins, Roelofarendsveen, both of Netherlands, assignors to Multinorm, B. V., Nieuw-Vennep, Netherlands

Filed Jun. 16, 1982, Ser. No. 389,036

Claims priority, application Netherlands, Jul. 1, 1981, 8103166

Int. Cl.³ A01D *35/264*

U.S. Cl. 56—13.6 **27 Claims**



15. A mowing device comprising, in combination:

a frame adapted to be attached to a powered vehicle;

an elongate girder carried in cantilever fashion by said frame and extending therefrom in a direction transverse to the direction in which the mowing device travels in use;

an elongate cutter bar disposed below said girder and means pivotally suspending the outer end of said cutter bar from the outer end of said girder for limited vertical rocking movement relative thereto whereby said cutter bar may closely follow over the ground surface;

a series of rotatable cutter means disposed in spaced relation along the length of said cutter bar for cutting a swath of crop having a width commensurate with the length of said cutter bar, and

transmission means for simultaneously driving said cutter means, said transmission means including an input shaft journalled on said frame and a drive train between said input shaft and said cutter means, said drive train including a final drive portion within said cutter bar, an input portion extending overhead along said girder from said input shaft, and a vertical portion at the outer end of said girder connecting said input portion to said final drive portion.

4,428,182

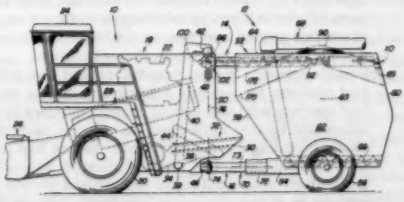
GRAIN HANDLING ARRANGEMENT FOR AN ARTICULATED COMBINE

James R. Allen, Bettendorf, Iowa; LaVerne Anderson, Jr., New Windsor, and Daniel L. Leemans, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 23, 1982, Ser. No. 371,047

Int. Cl.³ A01F *12/46;* **A01D** *41/00*

U.S. Cl. 56—14.6 **30 Claims**



1. An articulated harvester comprising:

a front bogie including a body supported above the ground

on laterally spaced wheels disposed so as to permit tipping of the bogie relative to the ground about a transverse axis and including means for gathering a crop from the field and at least partially processing it and delivering a first portion of crop material to an outlet of the front bogie;

a rear bogie including a body supported above the ground on laterally spaced wheels disposed so as to permit tipping of the bogie relative to the ground about a transverse axis and including a crop material receiving means;

means for connecting the bogies in tandem so as to control relative tipping between them and including at least one hinge member defining at least one pivot center and permitting relative pivoting between the bogies about upright and fore-and-aft axes both passing through the pivot center;

means for receiving crop material from the outlet of the front bogie and transferring it to the receiving means of the rear bogie and including a conveyor portion coextensive with a hinge member of the connecting means; and

power means carried by the harvester and operable to pivot the bogies one relative to the other about the upright axis for steering the harvester.

4,428,183

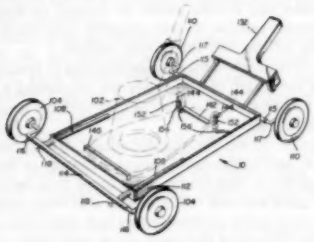
CARRIAGE FOR A GRASS TRIMMING DEVICE

Joseph M. Lowry, 308 Sweetbriar Dr., and Ernest E. Griffin, 12306 Ridgefield Pkwy., both of Richmond, Va. 23233

Continuation-in-part of Ser. No. 119,176, Feb. 6, 1980, Pat. No. 4,287,709. This application Aug. 25, 1981, Ser. No. 296,003

Int. Cl.³ A01D *35/12, 67/00*

U.S. Cl. 56—17.2 **11 Claims**



1. A carriage for a trimming device of the type having a motor, a housing for the motor, a cutting element in the form of a length of cable connected to said motor so as to be rotatable about an axis at high speed for cutting vegetation, said carriage comprising:

a platform having top and bottom surfaces defining an aperture for receiving and supporting a motor driven trimming device, a front edge, a rear edge, and opposite side edges extending between said front and rear edges, and means for supporting said platform for movement over ground including a front pair of wheels rotatably mounted adjacent said front edge and a rear pair of wheels rotatably mounted adjacent said rear edge thereby defining a predetermined longitudinal distance between said front and rear pairs of wheels whereby said bottom surface is supported above said ground a predetermined distance so as to define a space in which said cutting element rotates;

releasable retaining means mounted on said top surface of said platform for securely holding said cutting device in said aperture with said cutting element disposed to extend below said bottom surface and said ground, said retaining means including a retaining member having first and second engaging ends, said retaining member adapted to be transversely positioned above and across a portion of said housing so as to be in contact therewith when said trimming device is operatively positioned upon said platform, and first and second clamping means for respective clamping engagement with said first and second engaging ends,

each of said clamping means including a support member rigidly attached to and extending above said top surface, means for engaging said engagement end of said retaining member associated therewith, and a body member pivotably attached to said support member at one end and said engaging means at the opposite end so that said body member can be pivotable to allow said engagement means to engage said engagement end associated therewith and thereafter to be pivotable to an engaged position thereby effecting a bias force of said retaining member upon said cutting device to securely hold it in place upon said platform, and wherein

said platform supporting means further includes first means for longitudinally and telescopically adjusting said front edge and said front pair of wheels rotatably mounted adjacent thereto between a retracted position and an extended position thereby effecting a longitudinal variance in the distance between said front and rear pairs of wheels.

4,428,184

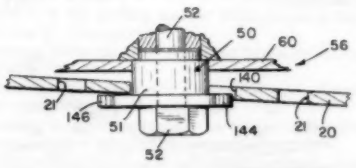
SAFETY MOUNTING FOR LAWN MOWER BLADE

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Continuation-in-part of Ser. No. 158,700, Jun. 12, 1980, Pat. No. 4,326,368, which is a continuation-in-part of Ser. No. 114,956, Jan. 24, 1980, Pat. No. 4,316,355. This application Apr. 1, 1982, Ser. No. 364,422

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—295 **3 Claims**



1. A safety mounting for a rotary lawn mower blade, comprising

a blade carrier mounted for rotation on the axis of a depending drive shaft and a plurality of eccentrically positioned blade bolts for securing a blade to the carrier,

a blade having bolt holes for the reception of said blade bolts and having a central opening on the axis of the carrier,

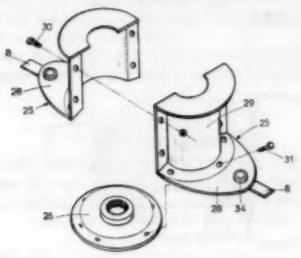
a blade retainer fixed on the drive shaft and extending through said central blade opening in rotatable relation with the blade,

and an enlarged head on the retainer, below the blade, and operative to obstruct axial separation of the blade from the retainer in the event the bolts fail to hold the blade on the carrier during operation of the mower, said enlarged head comprising two opposite projections having a combined length greater than the width of the central blade opening and said opening having a size and shape relative to the shank of the blade retainer to permit the blade to be moved radially of the retainer to clear one projection, the blade being then tiltable to be disengaged from that projection and then movable in the opposite direction to clear the second projection.

4,428,185
MOWER

Alain Toillie, Strasbourg, and Guy Rostoucher, Otterstahl, both of France, assignors to Kuhn S.A., Saverne, France

Filed Dec. 14, 1981, Ser. No. 330,270
Claims priority, application France, Dec. 18, 1980, 80 27393
Int. Cl.³ A01D *35/264*
U.S. Cl. 56—295 **4 Claims**



1. In a mower comprising in combination a plurality of rotatable cutter supports,

transmission means housed in a casing extending below said cutter supports, for driving said cutter supports in rotation,

at least one of said supports being in driving connection with a shaft, extending through said one support,

said one support comprising a hub and a plurality of detachable segments defining a conveying surface for the cut produce, each segment being rigidly secured to said hub,

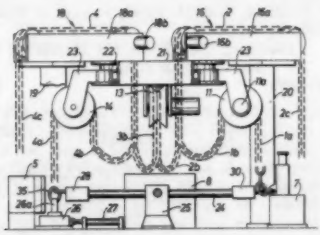
each segment including a substantially horizontal conveying surface and a substantially vertical conveying surface for the cut produce,

said substantially vertical conveying surfaces of the segments of said support forming a cylinder.

4,428,186
CHAIN MAKING APPARATUS

Thomas Hedren, Askersund; Albert Eriksson, Laxå; Sylve Antonasson, Hallsberg, and Rolf Larsson, Laxå, all of Sweden, assignors to ESAB Aktiebolag, Sweden

Filed Apr. 23, 1982, Ser. No. 371,252
Claims priority, application Sweden, Apr. 28, 1981, 8102673
Int. Cl.³ B21L *7/00*
U.S. Cl. 59—16 **9 Claims**



1. Apparatus for the simultaneous manufacture of several chains, comprising

means for successively presenting end portions of lengths of chain previously formed to each of not less than three and not more than five operating stations for performing a sequence of operations including bending a piece of bar stock into a C-shaped lug engaging the lowest link of said depending portion, closing said C-shaped lug to form a link, and flash welding and trimming the joint of said link, said operating stations being disposed at substantially equal angular intervals around a circular course,

said means comprising

a number of conveyors equal to the number of said operating stations, and,

means for supporting said conveyors rotary displacement about a vertical axis through the centre of said circular course,

the conveyors being arranged simultaneously to present the depending chain portions to the respective operating stations and having each a receiving end for supporting the depending chain portion and a discharge end the distance of which to said vertical axis is less than the one of the receiving end,

the apparatus furthermore comprising

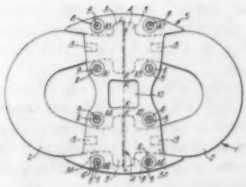
a second set of conveyors the number of which is equal to the number of said first-mentioned conveyors, and,

stationary means for supporting said second set of conveyors in positions in which the distance of the receiving end of each of the conveyors from said vertical axis is smaller than the distances of the discharge ends of said first conveyors from said vertical axis; the discharge end of each of said second conveyors being located at the upper end of a chain withdrawal path or space outside the radial limits of the annular space required for the angular displacements of said first conveyors and the chain portions supported by them.

4,428,187
JOINING SHACKLE OR LINK

Peter Bruce, Court View, 12 Mount Havalock, Douglas, Isle of Man

PCT No. PCT/GB80/00131, § 371 Date May 1, 1981, § 102(e) Date Apr. 23, 1981, PCT Pub. No. WO81/00607, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 26, 1980, Ser. No. 261,154
Claims priority, application United Kingdom, Aug. 31, 1979, 7930258
Int. Cl.³ F16G *13/06*
U.S. Cl. 59—85 **14 Claims**

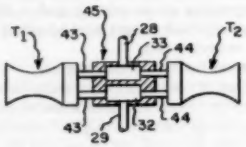


1. A chain joining link comprising a link-shaped assemblage providing opposed U-portions for retaining adjoining chain sections, the assemblage including a plurality of assemblable parts to enable the link to be fitted to the adjoining chain sections, at least one of said parts being provided with flange means while another of said parts is provided with recess means to receive said flange means during assembly of the link, the operative width of the recess means being less than the corresponding width of the flange means both measured when the link is in the unassembled state so that when the link is assembled with the flange means located in the recess means, the flange means maintain the recess means in an expanded condition whereby the flange means is subjected to a substantial preload in compression while the part containing the recess means is subjected to a substantial preload in tension.

4,428,188
BISTABLE FUEL VALVE

Clement J. Taransky, Tonawanda, and Gerard J. LeBlanc, North Tonawanda, both of N.Y., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 966,888, Dec. 6, 1978, Pat. No. 4,343,329.
This application Feb. 19, 1982, Ser. No. 350,259
Int. Cl.³ F02K 9/02
U.S. Cl. 60—225 4 Claims



BI-PROPELLANT

1. A magnetically actuated bistable thruster valve assembly comprising, in combination:

a permanent magnet assembly including a pair of spaced apart, plate-like permanent magnets disposed in similarly poled positions, first and second pole plates sandwiching said permanent magnets therebetween and forming therewith a generally enclosed space, and said pole plates having mutually spaced opposite end portions whereby to define air gaps therebetween;

an armature disposed within said space and having opposite end portions respectively received in said gaps;

flexure means within said space and connected substantially centrally to said armature for allowing said armature to rock between a first position in which one end thereof engages one pole plate while the other end engages the other pole plate to establish a flux field in one direction through the armature and a second position in which said one end thereof engages said one pole plate, said flexure means normally urging said armature to a neutral position between said first and second positions thereof and said permanent magnets having sufficient strength to retain said armature in either of its first and second positions, once attained;

a pair of coils disposed in said space in surrounding relation to said armature for opposing, when sequentially energized, the respective flux field established in said armature by said permanent magnets whereby to allow said armature to be released from its first position and snap toward its second position and vice versa;

pulsing means for periodically and transiently energizing said coils to oppose said flux fields for times sufficient to allow said armature to move from one position to the other;

a valve block mounted below said pole plates and defining a valve chamber, means for delivering propellant under pressure into said chamber, and a pair of oppositely directed propellant outlets communicating with said chamber;

a valve member connected to said armature and projecting downwardly from said space into said chamber, said valve member having two valves thereon for respectively closing off said propellant outlets when said armature is in its first and second positions;

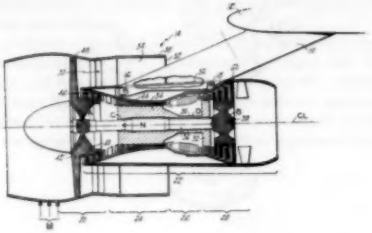
oppositely directed thruster means connected to said respective propellant outlets; and

means for varying said pulsing means to control the net thrust produced by said thrusters.

4,428,189
CASE DEFLECTION CONTROL IN AIRCRAFT GAS TURBINE ENGINES

Paul B. Greenberg, Manchester; C. Heinz Lenkeit, South Windsor, and Willard J. Seibert, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1980, Ser. No. 136,608
Int. Cl.³ F02C 7/20
U.S. Cl. 60—226.1 4 Claims



1. An aircraft gas turbine engine of the type having an engine case and including forward mounting means and rearward mounting means for attaching the engine case to the aircraft, wherein the improvement comprises:

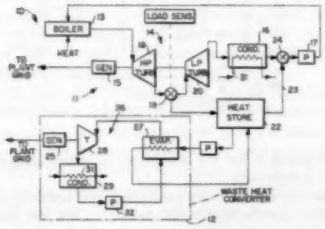
means external to the engine case and pivotable about the forward mounting means for transferring loads applied about the forward mounting means to a location on the engine case downstream of the second mounting means.

4. An aircraft gas turbine engine of the turbofan type having a fan section and a core section wherein the core section is circumscribed by an engine case having at the forward end thereof a first mounting means and at the rearward end thereof a second mounting means for attaching the engine case to the aircraft, and having a cowl structure attached at one end to the engine case downstream from the fan section, and pivotable about the forward mounting means wherein the cowl is attached at the other end thereof to the engine case at a location downstream of the second mounting means so as to be capable of resisting case deflection downstream of the second mounting means in response to moments generated by thrust loads about the first mounting means.

4,428,190
POWER PLANT UTILIZING MULTI-STAGE TURBINES

Lucien Y. Bronicki, Rehovot, Israel, assignor to Ormat Turbines, Ltd., Yavne, Israel

Filed Aug. 7, 1981, Ser. No. 291,084
Int. Cl.³ F01K 3/00, 23/02
U.S. Cl. 60—655 3 Claims



1. An integrated power plant comprising:

(a) a steam boiler operable to deliver a rated amount of high-pressure steam at rated temperature and pressure to a

steam turbine having a high-pressure stage and at least one low-pressure stage driven by low-grade steam exhausted from the high-pressure stage;

(b) a main generator driven by the steam turbine for furnishing the electricity to a variable load;

(c) a heat store containing water for storing low-grade heat;

(d) actuatable means for selectively diverting said low-grade steam into the water of the heat store for heating the same;

(e) a feed pump for removing water from the heat store and inputting it into the boiler, sufficient water being removed from the heat store to maintain the steam output of the boiler at its rated value; and

(f) a waste heat converter responsive to low-grade heat in the heat store for furnishing electricity to the variable load.

4,428,191

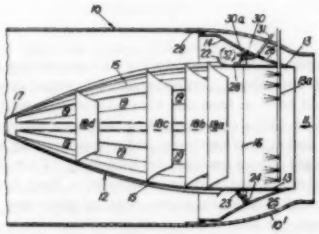
FUEL COMBUSTION IN DUCTED FLOW

Christopher D. Lane, and Rodney A. Rowe, both of Bristol, England, assignors to Rolls Royce Limited, London, England

Filed Oct. 1, 1964, Ser. No. 400,956

Int. Cl.³ F02C *1/00*

U.S. Cl. 60—737 **7 Claims**



1. Combustion apparatus comprising a duct for containing a flow of air and including an air-fuel mixing device comprising an assembly of transversely spaced longeron members which extend along the duct and are inclined to the general direction of flow through the duct and to the walls of the duct so that a major portion of the flow through the duct will pass through the spaces between thelongeron members, longeron member having longitudinal edges adapted in operation to shed continuous vortices, and a baffle extending across the upstream end of the longeron members and forming behind it a sheltered pilot combustion zone and means adapted to generate pilot vortices of combustible mixture in the pilot zone, to cause each pilot vortex to divide, and to direct the divided portion of each pilot vortex to pass downstream along adjacent parts respectively of adjacent longeron members.

4,428,192

TURBOCHARGED INTERNAL COMBUSTION ENGINE

Hans Dinger, Friedrichshafen, and Helmut Klotz, Tettnang, both of Fed. Rep. of Germany, assignors to MTU Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 92,028, Nov. 7, 1979, abandoned. This application Apr. 15, 1982, Ser. No. 368,642

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849723

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—606 **21 Claims**

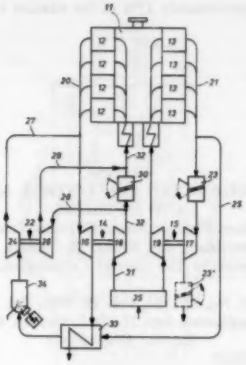
1. An internal combustion engine, comprising

several cylinder means having input and output line means,

means for supercharging comprising at least one supercharging aggregate, each supercharging aggregate comprising an exhaust gas turbine means and a compressor means,

means for causing at partial load of the engine some cylinder means to operate as an engine and other cylinder means to operate in the meantime as a compressor for supplying compressed gas,

further means for supercharging comprising a further supercharging aggregate characterized in that the compressed gas is fed to a turbine means thereof, wherein



the exhaust gas from the turbine means of the further supercharging aggregate is fed to the exhaust gas from the cylinder means operating as an engine and thence into an exhaust gas turbine means of said means for supercharging.

4,428,193

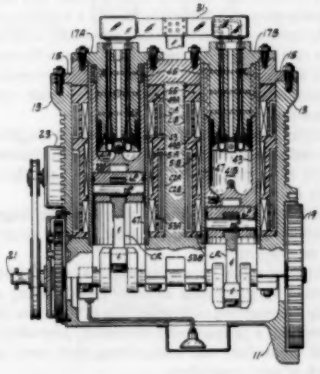
INERT GAS FUEL, FUEL PREPARATION APPARATUS AND SYSTEM FOR EXTRACTING USEFUL WORK FROM THE FUEL

Joseph Papp, Santa Ana, Calif., assignor to Papp International Incorporated, Lincoln, Nebr.

Filed Sep. 4, 1980, Ser. No. 184,405

Int. Cl.³ F01K *25/08*

U.S. Cl. 60—509 **71 Claims**



1. An engine having a closed chamber for a working fluid, comprising:

a head having a generally concave depression therein, the head defining one end of the chamber;

a piston having a generally semitoroidal depression in its upper surface, the piston being axially movable with respect to the head from a first position to a second position and back, the piston defining the other end of the cham-

ber, the volume of the chamber being determined by the position of the piston relative to the head; and

means, including a plurality of electrodes extending into the chamber, for ionizing the working fluid, said working fluid consisting essentially of an inert gas mixture of helium, neon, xenon, krypton and argon, said argon constituting approximately 17% of the mixture by volume.

4,428,194

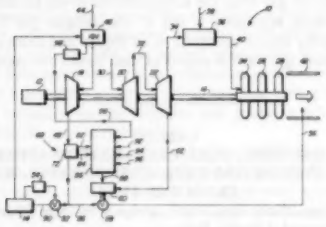
COMPRESSOR BLEED AIR CONTROL APPARATUS AND METHODS

Richard F. Stokes, Phoenix; James D. Timm, Tempe; Stephen R. LaCroix, Scottsdale, and Milton R. Adams, Tempe, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 235,794, Feb. 19, 1981, Pat. No. 4,380,893. This application Sep. 27, 1982, Ser. No. 424,674

Int. Cl.³ F04D *27/02*

U.S. Cl. 60—39.02 **4 Claims**



1. A method of controlling a surge bleed valve, positioned in a surge outlet passage of a compressed air supply duct interconnected between the outlet of a compressor and the inlet of pneumatically-powered apparatus having a variable supply air demand, to assure a predetermined, essentially constant minimum flow rate through the supply duct despite fluctuations in the supply air demand of the pneumatically-powered apparatus, the compressor having adjustable inlet guide vanes, said method comprising the steps of:

(a) producing a first control signal having a magnitude proportionally related to the magnitude of deviation, from a desired flow rate, of the actual flow rate through the supply duct;

(b) producing a second control signal whose magnitude is the integral, as a function of time, of said magnitude of flow rate deviation,

said control signal producing steps (a) and (b) being performed by generating an error signal having a magnitude representing said magnitude of flow rate deviation, providing a proportional controller, providing an integral controller, and transmitting said error signal to each of said controllers,

said generating of said error signal including the steps of sensing within the supply duct the value of the parameter $(P_T-P_s)/P_s$, P_T being the total pressure within the supply duct and P_s being the static pressure therein, and transmitting a signal indicative of the sensed value of said parameter to an inlet of a comparator having an adjustable set point; and

(c) adjusting said set point in response to variations in the position of the inlet guide vanes.

4,428,195

ROTARY VACUUM PUMP

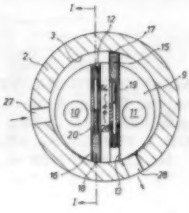
Ernst Linder, Mühlacker; Helmut Rembold, Stuttgart, and Walter Teegen, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,465

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1980, 3015409

Int. Cl.³ F04C *29/08;* **F02B** *67/00*

U.S. Cl. 60—397 **6 Claims**



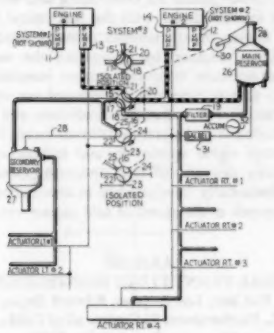
1. A rotary pump for producing vacuum having a housing provided with a bore, a rotor arranged to rotate eccentrically within said bore, at least one vane provided on said rotor, an inlet and an outlet communicating with said rotor and separated by said at least one vane, and means applying a counter-force on said at least one vane for switching off pump vacuum, characterized in that said rotor includes at least one slot disposed on either side of a center point of said rotor, in which said at least one vane is mounted, a shaft secured to each said at least one vane and extending into said at least one slot, said shaft including first and second stops thereon, said means for applying a counter force relative to said at least one vane mounted in said at least one slot for sliding movement between said first and second stops relative to said shaft, said means comprises a counter-weight, said counter-weight being arranged to assume a first position at idle rpm and a second position at higher rpm, each said at least one vane having an end engaging said bore in said first position, of said counter-weight, said counter-weight acting to disengage the end of each said at least one vane from engaging said bore when in said second position of said counter-weight, whereby at higher rpm said pump ceases producing vacuum.

6. The combination, in a vacuum-servo braking system for a gasoline engine in a motor vehicle, of a vacuum-brake force amplifier, an intake tube, a first line provided with a check valve connected between said amplifier and said intake tube of said engine, a rotary pump, a second line provided with a check valve connected between said amplifier and said rotary pump, a third line connected between said rotary pump and a crankcase of said engine, and a fourth line connecting an oil pan of said engine with said rotary pump, said rotary pump comprising a housing provided with a bore, a rotor arranged to rotate eccentrically within said housing, two vanes provided on said rotor within separate slots on said rotor, an inlet and an outlet communicating with said rotor and separated by said vanes, a counter-weight mounted within said slot and movable relative to each vane, said counter-weight being arranged to assume a first position in said idling rpm range and a second position at an arbitrarily set higher rpm, each of said vanes having an end engaging said bore in said first position of said counter-weight, said counter-weight acting to disengage the ends of said vanes from said bore in said second position of said counter-weight, whereby at said higher rpm said pump ceases producing said supplementary vacuum.

4,428,196
AIRCRAFT SPLIT HYDRAULIC SYSTEM

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 14, 1980, Ser. No. 196,665
Int. Cl.³ F15B 11/16
U.S. Cl. 60—403 10 Claims



4. A split hydraulic system comprising:

a main reservoir;

first and second hydraulic pumps having suction ports and pressure ports;

a first valve means having two positions and four ports, said first position connecting ports **1** and **2** and ports **3** and **4** and said second position connecting ports **1** and **4** while ports **2** and **3** are shut off with said suction port of said first hydraulic pump connected to said first port and said suction port of said second hydraulic pump connected to a suction line between said second port of said first valve means and said main reservoir;

a secondary reservoir connected by a return line to said fourth port of said first valve means and said third port of said first valve means connected to said main reservoir;

a second valve means connected between the pressure output line from said first hydraulic pump and the pressure output line from said second hydraulic pump; and

means to actuate said first and second valve means.

4,428,197
STIRLING MECHANICAL ARRANGEMENTS ESPECIALLY FOR DOUBLE-ACTING PISTONS

Jon L. Liljequist, 801 S. Elmhurst Ave., Mount Prospect, Ill. 60056

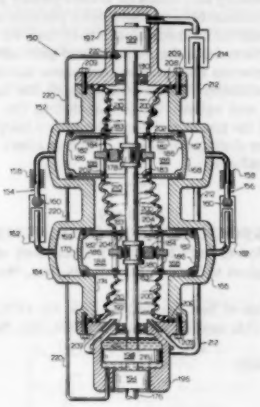
PCT No. PCT/US81/00924, § 371 Date Nov. 16, 1981, § 102(e) Date Nov. 16, 1981, PCT Pub. No. WO82/00688, PCT Pub. Date Mar. 4, 1982
Continuation-in-part of Ser. No. 178,711, Aug. 18, 1980, abandoned. This PCT application Jul. 9, 1981, Ser. No. 322,361
Int. Cl.³ F02G 1/04
U.S. Cl. 60—525 6 Claims

1. In a multiple cylinder Stirling engine that includes an engine block defining a first and second cylinder, said first cylinder including a first double-acting piston that acts at least in one direction as a power piston, said second cylinder including a second piston that acts at least in one direction as a displacer, a crankshaft passageway extending perpendicularly to the movement of the pistons and located generally centrally of the engine block, and a crankshaft disposed in said crankshaft passageway and rotatably mounted in said block, said crankshaft extending from inside said crankshaft passageway to the environment external of said block through a dynamic seal interposed between the block and the crankshaft, the improvement comprising:

said pistons being hollow with side entrances therein through which the crankshaft extends;

substantially direct interconnection means between said power piston and said crankshaft in a form other than that of a conventional and elongate connecting rod;

and static sealing means surrounding said crankshaft and

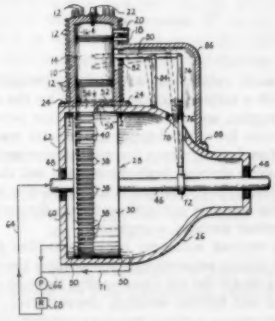


flexibly connected to the pistons to form a separate crankshaft enclosure as part of the crankshaft passageway, said static sealing means being statically connected to the block so that those portions of the crankshaft passageway not included within the crankshaft enclosure are isolated from the environment external of said block by way of static rather than dynamic sealing means.

4,428,198
HYDRAULIC MOTION CONVERSION DEVICE FOR ENGINES

S. R. Sutter, 1950 Highland, Lebanon, Mo. 65536

Filed Sep. 16, 1981, Ser. No. 302,735
Int. Cl.³ F02B 71/04
U.S. Cl. 60—595 10 Claims



1. A motion conversion device for an engine having a piston reciprocating in a cylinder to provide compression and power strokes, said device comprising:

a housing;

a hollow rotor mounted for rotation in said housing and adapted to hold hydraulic fluid, said rotor having a periphery sealed to said housing and divided into first and second annular surfaces extending generally side by side around said periphery;

an open portion of said first annular surface providing fluid communication between the inside and outside of said rotor to direct fluid out of said rotor and into said cylinder;

a plurality of vanes on said second annular surface for receiving fluid from the cylinder to effect rotation of said rotor; and

means for sealing said vanes from the cylinder and providing communication between said open portion and the cylinder during the compression stroke and for sealing said open portion from the cylinder and providing communication between the cylinder and vanes during the power stroke, whereby fluid is forced from the rotor into the cylinder and against the piston during the compression stroke of the piston and is expelled from the piston against said vanes during the power stroke to effect driving rotation of said rotor.

4,428,199

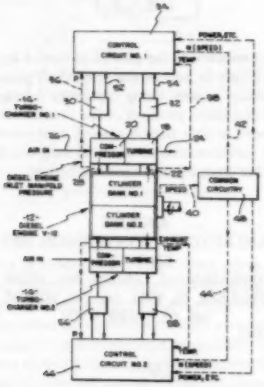
TURBOCHARGER CONTROL SYSTEM

M. Samuel Moore, and Charles F. Paluka, both of Northridge, Calif., assignors to Semco Instruments, Inc., No. Hollywood, Calif.

Continuation of Ser. No. 15,956, Feb. 28, 1979, Pat. No. 4,292,806. This application Aug. 3, 1981, Ser. No. 289,472

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—600 **9 Claims**



1. A control system for a diesel engine having a turbocharger with a turbine section operated by the exhaust gases from said engine, and a compressor section powered by said turbine section for supplying air to the inlet manifold of said engine, and including means for variably controlling the flow of gases passing through both the turbine and the compressor sections of said turbocharger, and means for independently adjusting the variable controlling means for said compressor and said turbine sections, comprising:

first and second actuators each controlled by electronic circuit means respectively, for shifting the variable controlling means for the gases passing through said compressor and said turbine sections, respectively;

means for sensing various operating parameters of the engine including means for sensing the speed of said engine and for supplying electrical signals representing said speed to both of said electronic circuit means, means for sensing the inlet manifold pressure of said engine and for supplying electrical signals representing said pressure to both of said electronic circuit means, and means for sensing the temperature of the exhaust gases from said engine and for supplying electrical signals representing said temperature to said electronic circuit means;

electronic circuit means for determining the theoretical optimum or desired inlet manifold pressure from the speed of the engine and the temperature;

electronic circuit means for controlling said first compressor actuator in accordance with a substantially linear function of the sensed speed of the engine, and with an incremental additional actuation in accordance with the sensed inlet manifold pressure;

electronic circuit means for controlling said second turbine actuator in accordance with the theoretical optimum or desired engine input manifold pressure modified by an error signal obtained by comparing the sensed actual manifold pressure with the desired manifold pressure, whereby said turbine and compressor are operated just below "stall" or "cavitation" conditions; and

means included in said electronic circuit means for changing the control signal applied to said turbine actuator and maintaining desired different optimum operating conditions substantially continuously at successively different engine speeds as the speed of said engine varies.

4,428,200

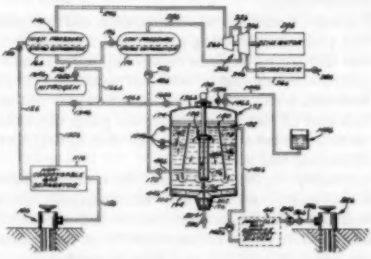
GEOTHERMAL PLANT FLUID REINJECTION SYSTEM

Barkman C. McCabe, Los Angeles; Edward Zajac, Hollywood, and John L. Featherstone, El Centro, all of Calif., assignors to Magma Power Company, Los Angeles, Calif.

Filed Aug. 13, 1980, Ser. No. 177,633

Int. Cl.³ F03G *7/04*

U.S. Cl. 60—641.5 **59 Claims**



1. The method of extending the operational life of a reinjection well in a geothermal energy system which has a geothermal brine flow path comprising a production well providing a stream of high temperature, high dissolved silica content geothermal brine, heat extraction means and a reinjection well, which comprises:

establishing a zone of particulate material in said flow path between said heat extraction means and said reinjection well,

passing said geothermal brine stream through said zone in contact with said particulate material to seed the precipitation of dissolved silica from said brine onto said particles so as to reduce the amount of dissolved silica available for precipitation in said reinjection well, and

minimizing the occurrence of other chemical reactions in said zone which would be injurious to said reinjection well by excluding atmospheric oxygen from said zone.

4,428,201

POWER GENERATION WITH FRACTIONATOR OVERHEAD VAPOR STREAM

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

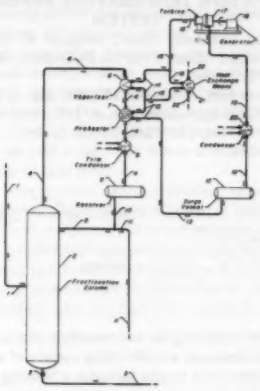
Filed Jul. 1, 1982, Ser. No. 394,375

Int. Cl.³ F01K *17/00*

U.S. Cl. 60—648 **12 Claims**

1. A method of vaporizing a liquid stream which comprises the steps of:

(a) heating a first liquid stream by indirect heat exchange against a hereinafter characterized warm fluid stream;
(b) dividing the first liquid stream into a second liquid stream and a third liquid stream;
(c) vaporizing substantially all of the second liquid stream by indirect heat exchange against the overhead vapor stream



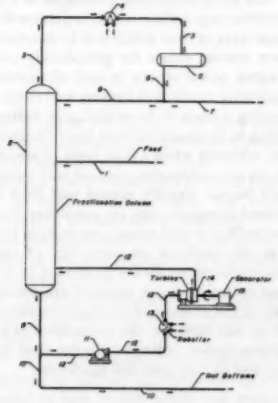
of a fractionation column, with the overhead vapor stream thereby being converted into the previously referred to warm fluid stream; and,
(d) vaporizing substantially all of the third liquid stream by indirect heat exchange against a heat source other than the overhead vapor stream of the fractionation column.

4,428,202

ELECTRICAL POWER GENERATION BY FRACTIONATION COLUMN REBOILER

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 1, 1982, Ser. No. 394,374
Int. Cl.³ F01K *17/00*
U.S. Cl. 60—648 **12 Claims**



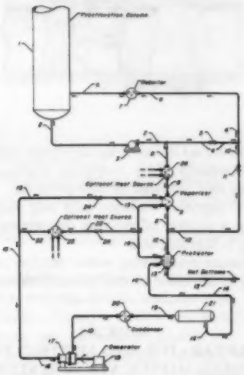
1. A process for generating useful mechanical power which comprises the steps of:
(a) passing at least a portion of a liquid stream removed from a lower porton of a fractionation column through a reboiler means operated at a significantly higher pressure than the fractionation column and thereby forming a reboiler effluent stream;
(b) depressurizing the reboiler effluent stream in a turbine and thereby recovering useful mechanical power and also producing a turbine effluent stream; and,
(c) passing the turbine effluent stream into the fractionation column to thereby reboil the fractionation column.

4,428,203

POWER GENERATION USING FRACTIONATION COLUMN REBOILER SYSTEMS

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 1, 1982, Ser. No. 394,373
Int. Cl.³ F01K *17/00*
U.S. Cl. 60—648 **12 Claims**



1. A process for vaporizing a working fluid which comprises the steps of:
(a) heating a liquid-phase stream of the working fluid in a first indirect heat exchange means wherein less than five mole percent of the working fluid is vaporized by heat exchange against the net bottoms stream of a fractionation column;
(b) vaporizing at least a portion of the working fluid stream in a second indirect heat exchange means by heat exchange against a high temperature first process stream comprising the net bottoms stream of the fractionation column and an additional amount of the total bottoms stream of the fractionation column and thereby forming a low temperature second process stream.

4,428,204

METHOD FOR FORMING A TEMPORARY PLUG IN A FLUID CONDUIT

Beryle D. Brister, P.O. Box 9272, Amarillo, Tex. 79105

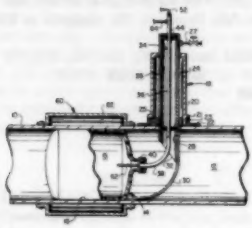
Filed Dec. 8, 1981, Ser. No. 328,029
Int. Cl.³ F25D *25/00*
U.S. Cl. 62—62 **18 Claims**

1. A method for forming a substantially fluid flow stopping plug in a conduit such as a fluid transmission pipeline comprising the steps of:
providing a fitting attachable to the exterior sidewall of said pipeline at a predetermined location on said pipeline, said fitting being adapted to support a tapping machine for tapping a hole in said sidewall and an insertion apparatus for inserting a flexible bag into said pipeline through said hole;
providing said tapping machine and said insertion apparatus;
installing said fitting on said pipeline;
installing said tapping machine and tapping a hole through said sidewall;

removing said tapping machine and installing said insertion apparatus on said fitting;

inserting said bag into the interior of said pipeline and deploying said bag at a predetermined location spaced from said hole;

filling said bag with liquid until said bag is expanded to substantially fill the cross-sectional flow area of said pipeline at said predetermined location;



freezing said liquid in said bag to expand said bag into forcible substantially flow stopping engagement with the interior of said sidewall of said pipeline;

cutting said pipeline between said bag and said hole and removing a section of pipeline containing said hole after said plug is formed; and

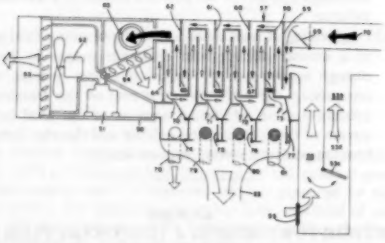
installing means comprising a new section of pipeline while said plug is disposed in said predetermined location.

4,428,205

APPARATUS AND METHOD FOR DEHUMIDIFICATION SYSTEMS

Earl S. Dederer, San Antonio, Tex., assignor to Trinity University, San Antonio, Tex.

Filed Apr. 27, 1981, Ser. No. 257,549
Int. Cl.³ F25D *17/06*
U.S. Cl. 62—93 **4 Claims**



1. A method for efficiently producing dry air, comprising the steps of:

flowing incoming air from an enclosure through the inbound portion of an air-to-air heat exchanger where it is precooled by outgoing air flowing though the outbound portion of said heat exchanger into the enclosure;

flowing the air that has been precooled from the inbound portion to a cooling means for reducing the dew point temperature where it is further cooled and dehumidified to provide cold dry air to the outgoing portion;

flowing the cold dry air from the cooling means through said outbound portion of said air-to-air heat exchanger to recover cooling provided by the cooling means and to provide said precooling of the incoming air;

flowing the dry outgoing air out of the outbound section of the air-to-air heat exchanger into the enclosure; and

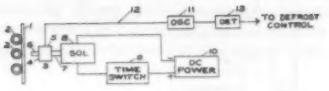
varying the amount of cooling recovered from the cold dry air flowing through the outbound portion of the heat exchanger to vary the temperature and humidity of the air exiting the outbound portion.

4,428,206

MEANS FOR DETECTING THE ACCUMULATION OF FROST IN A LOW TEMPERATURE REFRIGERATION SYSTEM

Frank Massa, Cohasset, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees

Continuation-in-part of Ser. No. 183,231, Sep. 2, 1980, Pat. No. 4,348,869. This application Jan. 6, 1982, Ser. No. 337,458
Int. Cl.³ F25D *21/02, 21/06*
U.S. Cl. 62—140 **5 Claims**



1. Means for detecting the accumulation of a layer of frost of a specified thickness on a subfreezing surface of a refrigerating system, said detection means includes a housing structure, an electromechanical transducer element contained within said housing, said transducer element characterized in that its electrical characteristic is subject to change when said transducer element is acted upon by a mechanical force, a mechanical force transmission member, compliant mounting means attached to said housing structure and adapted for holding said force transmission member in a fixed unobstructed operable position relative to said housing structure, said mounted force transmission member characterized in that it includes an exposed unobstructed surface area portion located external to said housing structure and a non-exposed surface area portion located internal to said housing structure in close proximity to said transducer element contained within said housing, adjustable remote controlled positioning means attached to said housing structure, said adjustable positioning means characterized in that it holds said exposed unobstructed surface area portion of said force transmission member at a fixed distance from said subfreezing surface which is greater than said specified thickness layer of frost which is to be detected, a command signal power source, means for periodically connecting said command signal power source to said adjustable remote controlled positioning means thus causing said fixed distance from said subfreezing surface to be periodically reduced to a value corresponding to the specified frost layer thickness which is to be detected, whereby when a frost layer of specified thickness has formed on said subfreezing surface said force transmission member will impact directly against said frost layer and the force generated at impact upon the execution of said command signal is transmitted to said transducer element thereby causing a change in the electrical characteristic of said transducer element, detection circuit means connected to said transducer element, said detection circuit means characterized in that said change in electrical characteristic of said transducer element is recognized by said detector, the recognition of said change in electrical characteristic indicates that the frost layer thickness has accumulated to said specified thickness.

4,428,207

DEHUMIDIFIER

William B. Hall, Lakeworth, Fla., assignor to Martin Industries, Inc., Florence, Ala.

Filed Oct. 9, 1981, Ser. No. 307,430
Int. Cl.³ F25D *17/04;* **G05D** *22/00*
U.S. Cl. 62—176.1 **1 Claim**

1. A dehumidifier comprising:

a cabinet having an upper, vertical entrance opening and a lower, exit opening;

a refrigerant compressor positioned in a generally lower region of said cabinet;

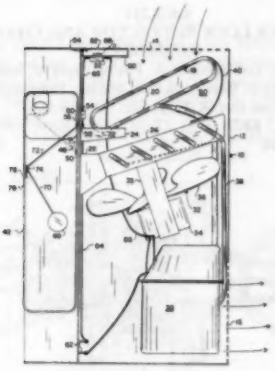
a refrigerant condenser comprising a heat exchanger mounted in a region of said cabinet above said compressor and extending across said cabinet and oriented to intercept air flow from said entrance to said exit;

a refrigerant evaporator positioned above said condenser in said cabinet having a tilted plane of configuration

a condensate pan supported by said cabinet and having a drain, said pan having an upper opening surrounding a lower tilted side of said evaporator, whereby moisture forming on said evaporator flows downward along said evaporator to said pan;

refrigerant connections interconnecting said compressor, condenser and evaporator comprising a compressed fluid line from said compressor to said condenser, a high-to-low pressure coupler between said condenser and evaporator, and a return line from said evaporator to said compressor;

an electrically powered fan positioned below said condenser in said cabinet and oriented and powered to rotate in a



direction, to draw air downward from said entrance, through said evaporator and condenser, and forcing the air outward through said lower exit;

humidity sensing means including switching means for turning said fan, motor and compressor "on" responsive to a selected level of environmental humidity;

a condensate container removably supported on said cabinet and having an opening aligned with said drain to receive condensate from said pan;

a normally "off" switch mounted on said cabinet and adjacent to said container when said container is supported on said cabinet;

a float and lever coupled to said float, said lever being pivotally supported by said container and having an arm operably coupled to said switch when said container is supported on said cabinet and operating said switch to an "on" state when said container is in less than a selected liquid full state; and

said switch being coupled in circuit between said humidity sensing means and said motor of said fan and said compressor, and thereby enabling the application of power only when said container is in place on said cabinet and said container is in less than a selected liquid full state.

4,428,208

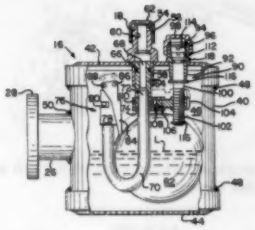
OIL CONTROL SYSTEM AND REGULATOR

Richard J. Krause, Addison, Ill., assignor to AC&R Components, Inc., Melrose Park, Ill.

Filed Jan. 21, 1982, Ser. No. 341,280

Int. Cl.³ F25B *31/00*; F16K *31/18*; F01M *11/12*

U.S. Cl. 62—192 **10 Claims**



1. A liquid level regulator for regulating the oil level in a crankcase sump, comprising:

a closed chamber for containing the liquid,

inlet means including a cylinder for admitting liquid to said chamber,

discharge means for discharging liquid from said chamber to the sump,

piston means slidably movable in said cylinder and contained substantially entirely within said chamber and having a passage therein through which the liquid entering the chamber from said inlet means passes,

valve means in said inlet means for receiving the liquid from said piston means,

float means in said chamber connected to said valve means for opening and closing said valve means in response to the level of liquid in said chamber, said float means being mounted to said piston means for movement with said piston means to adjust the elevation of said float means when said piston means is slidably moved, and

adjustment means for adjusting the elevation of said float means to adjust the level of liquid in said chamber, said adjustment means including rotatable means accessible from the exterior of said chamber for rotation thereof, and coupling means coupling said rotatable means to said pistion means in said closed chamber such that rotation of said rotatable means slidably moves said piston in said cylinder and said float means in elevation while liquid is being admitted through said inlet means.

4,428,209

CARDING DRUM FOR HIGH PILE CIRCULAR KNITTING MACHINES

Kozo Taniguchi, Hyogo, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed Jan. 15, 1982, Ser. No. 339,644

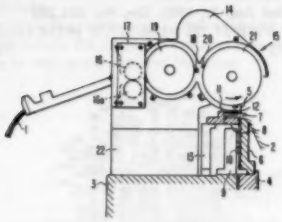
Claims priority, application Japan, Mar. 30, 1981, 56-45169[U]

Int. Cl.³ D04B *9/14*

U.S. Cl. 66—9 B **1 Claim**

1. Improvement in a sliver feeding device to feed sliver to the circle of latch needles of a circular knitting machine, the device being of the type having a comber and a doffer drum which act upon the sliver to transfer the sliver from the comber to the doffer drum and then to transfer the sliver from the doffer drum to the needles, the drums being of the type which are covered with spirally wound wrappings of card wire cloth, and the improvement in such device wherein the wrappings on the comber drum are composed of at least three

individual card wire cloths arranged to form a multiple spiral thereof and wherein the wrappings on the doffer drum are



comprised of a single individual card wire cloth arranged to form a single spiral thereof.

4,428,210

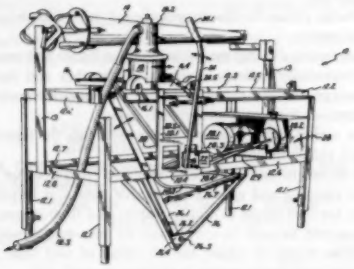
FLESHING MACHINE

Stephen N. Kraushaar, Litchfield, Minn., assignor to Mills Fur Farm Supply, Inc., Litchfield, Minn.

Filed Jun. 4, 1982, Ser. No. 384,788

Int. Cl.³ C14B *1/02*

U.S. Cl. 69—46 **5 Claims**



1. In a fleshing machine for removing unwanted tissue from an animal pelt and having a longitudinal mandrel for holding a pelt and fleshing means including a tissue-removing head moveable longitudinally and transversely with respect to the mandrel to remove tissue from the pelt, and a handle for moving the head with respect to the mandrel:

the improvement comprising dual linking means mechanically and hydraulically linking the handle to the tissue-removing head for hydraulically moving the head longitudinally of the mandrel in response to longitudinal components of movement of the handle with respect to the mandrel and for mechanically moving the head generally transversely of the mandrel in response to components of handle movement generally transverse of the longitudinal direction of the mandrel.

4,428,211

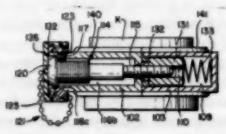
LOCKING DEVICE

Robert Hermann, Box 218, Stronghurst, Ill. 61480

Filed May 12, 1981, Ser. No. 262,815

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **10 Claims**



1. A locking device comprising:

(a) a lock cylinder containing a lock plug that is rotatable by rotation of a key inserted in said lock cylinder, a threaded rod being connected to the lock plug so as to be rotatable therewith;

(b) a relatively massive cylindrical lock housing having a bore extending axially therethrough, a first portion of said bore extending from a first end of said housing being configured for receiving said lock cylinder and a second portion of said bore extending from an opposite end of said housing having an internal diameter that is slightly larger than the external diameter of the threaded rod, said lock cylinder being disposed in said first portion of the housing bore with said threaded rod extending axially from said housing through said second portion of the bore;

(c) fastening means in said lock housing for securing said locking cylinder against rotational and axial movements relative to said lock housing;

(d) a relatively massive cylindrical sleeve member having a blind bore therein and screw thread means in a portion of said blind bore for threadingly engaging said threaded rod; and

(e) means on said lock housing and sleeve member for preventing said threaded rod and screw thread means from being threadingly engaged and disengaged by relative rotation between said lock housing and sleeve member.

4,428,212

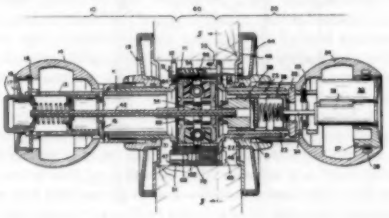
CYLINDER LOCK RETRACTOR AND CHASSIS ASSEMBLY

Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Oct. 8, 1981, Ser. No. 309,564

Int. Cl.³ E05B *9/10, 17/04, 17/08*; E05C *1/12*

U.S. Cl. 70—224 **20 Claims**



1. A cylinder lock chassis, comprising

a self-contained retractor assembly including a retractor frame, a retractor, and guide means guiding the retractor for rectilinear retractive movement in the frame, said guide means including means for confining the retractor to such retraction movement and for holding the retractor in self-contained relation with the frame,

inside and outside face assemblies, each having an end plate, the two plates being separably clamped against the sides of the retractor assembly and interlocked therewith so as to be held in coaxial relation with each other and the retractor assembly,

at least one of said face assemblies including a roll-back which in the assembled chassis is operative to actuate the retractor through its retractive movement.

4,428,213

DUPLEX PEENING AND SMOOTHING PROCESS

James W. Neal, Columbia; Joseph W. Sullivan, Glastonbury, and Joseph F. Loersch, Bolton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,723

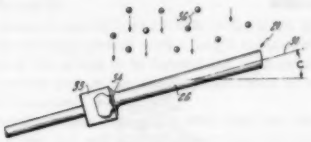
Int. Cl.³ C21D *7/06*; F01D *5/14*

U.S. Cl. 72—53 **9 Claims**

1. The method of surface treating a workpiece to provide residual compressive stresses and smooth surfaces finish, which comprises

(a) impacting a first portion of the workpiece with a first stream of shot, the shot having a mean diameter of less than about 1 mm, to provide the said first portion of the workpiece with a first set of residual stresses and a first surface finish;

(b) impacting a second portion of the workpiece with a



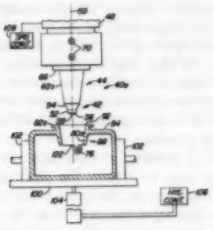
second stream of shot, the shot having a substantially uniform diameter in the range 1–2.5 mm and a substantially uniform mass and velocity, to provide a second set of residual stresses and a second surface finish smoother than about 30 AA, said finish being smoother than the first surface finish, said second impacted portion overlapping at least in part the first impacted portion.

4,428,214

FLOW DRILLING PROCESS AND TOOL THEREFOR

Glenn D. Head, Jr., Des Moines; William C. Le Master, Ankeny; Louis P. Bredesky, Jr., and David C. Winter, both of Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 8, 1982, Ser. No. 346,679
Int. Cl.³ B21D *28/36*
U.S. Cl. 72—69 **47 Claims**



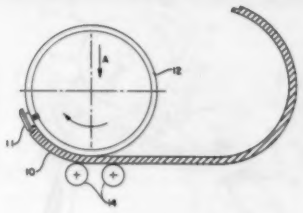
1. A forming tool for simultaneously forming a hole and a bushing in a metal workpiece of preselected thickness, said tool comprising an elongate member having a central axis, a first end portion adapted to be mounted in a drive and rotated about the central axis as the tool and the workpiece are moved axially with respect to each other, an opposite end portion having a cylindrically-shaped barrel portion terminating in a free blunt end, said end being substantially solid and generally cone-shaped with an apex located on the central axis for centering the tool, said end portion adapted to be rotated in frictional contact with the workpiece while pressed axially against the workpiece to soften the metal adjacent the blunt end and form a slug, a circular forming portion located between the ends and offset axially from the blunt end at least a distance equal to the thickness of the metal, said forming portion tapering radially outwardly from the barrel portion toward the first end portion and adapted to be rotated about the axis in frictional contact with the workpiece subsequent to the formation of the slug to fluidize the metal adjacent said forming portion and form a bushing having a maximum inner diameter substantially equal to the maximum diameter of the forming portion contacting the metal.

4,428,215

PLATE BENDING METHOD

Kenneth M. Hume, 8 Lister St., East Kew, Victoria, Australia

Filed Sep. 18, 1981, Ser. No. 303,515
Claims priority, application Australia, Sep. 19, 1980, PE5658
Int. Cl.³ B21D *5/12*
U.S. Cl. 72—133 **2 Claims**



1. A method of rolling plate to form a cylindrical article which comprises gripping a leading edge of a length of plate with a mandrel gripper so that the plate is tangential to the mandrel from the said edge; rotating the mandrel while engaging the remainder of the plate against the mandrel by pressure means to move the plate to curve a forward part of the plate about the mandrel into a semi-cylindrical shape; subsequently further advancing the plate until the rearward part of the plate and its trailing edge pass beyond contact with the mandrel; and then gripping the said trailing edge with the mandrel gripper and turning the mandrel again to curve the rearward part of the plate about the mandrel into a semi-cylindrical shape so that said forward and rearward parts together complete the formation of a cylinder; the improvement comprising the steps of: forming a recess in the leading and trailing edge portions of the plate before curving the plate; selecting a plate thickness greater than said recessed edge portions by an amount equal to the depth of said recesses; serially gripping said recessed leading and trailing edge portions with said mandrel gripper so that the unrecessed plate thickness is substantially the same as the maximum radial dimension of the mandrel gripper to thereby form a cylinder of small diameter for a given plate thickness having a smaller diameter to plate thickness ratio.

4,428,216

TUBE BENDER

Thomas A. Fling, 137 Northcreek Cir., Walnut Creek, Calif. 94598

Filed Jun. 14, 1982, Ser. No. 387,979
Int. Cl.³ B21D *7/04*
U.S. Cl. 72—156 **5 Claims**

1. A manually operable tube bender apparatus comprising:

(a) a frame member establishing

(i) a stationary handle,

(ii) a shoe portion,

(iii) and a supported center pin;

(b) a link member including a link pin supported on said center pin, said link pin being spaced from said center pin on said link member;

(c) a ratchet gear rotatably supported on said center pin and having a gripper member fixed thereto;

(d) a movable handle rotatably supported on said link pin in cooperating alignment with said stationary handle;

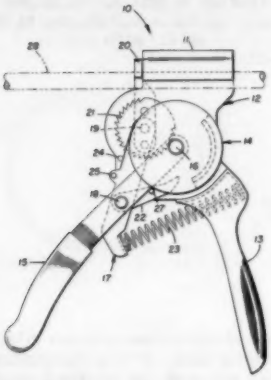
(e) a hub pin on said movable handle, said hub pin being spaced from said link pin support of said movable handle the same spacing as said space between said link pin and said center pin on said link member;

(f) a form member rotatably supported on said hub pin;

(g) a pawl member supported on said link pin and including a portion adapted to cooperate with said ratchet gear;

(h) said link member and said moveable handle being movable to cause said hub pin to be axially aligned with said

center pin and to cause said portion of said pawl to cooperate with said ratchet gear;



(i) whereby movement of said movable handle toward said stationary handle causes movement of said gripper with respect to said shoe portion and said form member.

4,428,217

SIDE GUIDES FOR ROLLING STEEL RODS

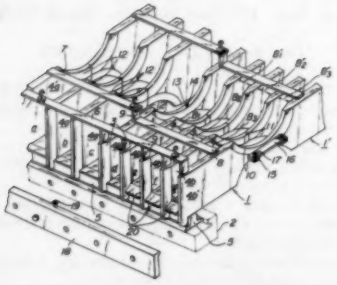
Tadaaki Yanazawa; Teruaki Tanaka, Aoyama; Kazuo; Akio Noda, and Takashi Morita, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 13, 1982, Ser. No. 377,707

Claims priority, application Japan, Jun. 30, 1981, 56-101487

Int. Cl.³ B21B *39/16*

U.S. Cl. 72—250 **5 Claims**



1. Side guides for rolling steel rods comprising front and rear rolling guide frames abuttingly combined with each other in a gap between a pair of grooveless rolling rolls having cylindrical surface barrels to embrace said pair of rolls on front and rear sides thereof so as to form defined rolling zones which are side by side in an axial direction of said rolls and divided by said rolling guide frames, said front and rear rolling guide frames being adjustable in the axial direction of said rolls, and the outermost rolling guide frames being provided on outsides of their abutting ends with connecting means.

4,428,218

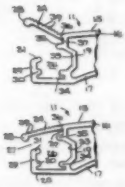
METHOD OF MANUFACTURE AND ASSEMBLY OF EXTRUDED ALUMINUM SALT FOR ROLLER SHUTTER

Joseph M. LaRocca, 190 Edgewater Dr., Coral Gables, Fla. 33133

Filed Nov. 24, 1981, Ser. No. 324,543

Int. Cl.³ B21C *23/14*

U.S. Cl. 72—256 **5 Claims**



1. A method of manufacturing an extruded aluminum slat for a roller shutter, the slat having a first member extending from a first edge and formed, in cross section, with a stem portion and a head portion, the head portion having greater transverse outer dimension then the stem portion, and front and rear members extending in spaced apart relation from the opposite edge, the rear member having a turned hook-like edge and forming in conjunction with the front member an undercut slot having an opening adapted to loosely receive a stem portion of a first member of another slat but too narrow to permit passage of the head portion of such first member, wherein the method comprises:

extruding aluminum through a die conforming to the desired final cross-sectional shape of the slat except that the opening of the die corresponding to the front member is angled away from the opening of the die corresponding to the rear member, so that said front member is extruded in spread apart relation to said rear member, thereby permitting the part of the die corresponding to the opening of the undercut slot to be strong enough to withstand the aluminum extruding pressure, and

bending said front member toward said rear member after the extruding step to obtain the desired final opening dimension therebetween, the cross-sectional shape of said front member having a reduced thickness where the front portion joins said opposite edge, said reduced thickness serving as a hinge to facilitate said bending step.

4,428,219

Patent Not Issued For This Number

4,428,220

METHOD AND TOOL FOR THE COLD FORGING OF INTERNALLY PROFILED TUBES

Ivan Oskar Rammesten, Eskilstuna, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Jan. 22, 1982, Ser. No. 341,660

Claims priority, application Sweden, Feb. 3, 1981, 8100771

Int. Cl.³ B21B *17/02*

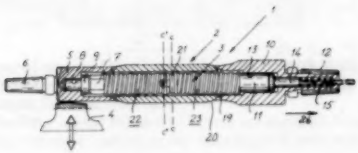
U.S. Cl. 72—370 **5 Claims**

1. Apparatus for cold forging a tubular blank to form the

same into a tubular article having a predetermined internal configuration, said apparatus comprising opposite forging hammers driven for repeated radially inward impacting against a blank that is supported between them and is constrained to rotation and axial motion in one direction relative to the hammers so that the hammers progress relatively along the blank from one to the other of its end portions, said apparatus being characterized by:

A. a mandrel coaxially receivable in the blank and having a form defining portion with a length substantially equal to that of the article to be formed and with an external configuration that is the mating counterpart of said internal configuration;

B. gripping means engageable with said one end portion of the blank and with the corresponding end portion of said



mandrel to confine those end portions against axial displacement relative to one another, said gripping means being arranged to provide for axial movement of the blank and the mandrel relative to the forging hammers;

C. clamping means for engaging said other end portion of the blank and applying to it a yielding axial biasing force whereby its said one end is maintained in engagement with the gripping means and its said other end is permitted to move axially away from the gripping means as the blank is elongated by the action of the hammers; and

D. mandrel confining means coaxially adjacent to said clamping means and engageable with the end portion of the mandrel that is remote from the gripping means to confine the mandrel against axial displacement relative to the gripping means.

4,428,221

TRANSFER APPARATUS FOR STRAIGHT SIDE PRESS

Roland G. Owens, 10850 Hall Rd., Box 145, Hamburg, Mich. 48139

Filed Jan. 22, 1982, Ser. No. 341,595
Int. Cl.³ B21J *11/00*
U.S. Cl. 72—405 **3 Claims**

1. In a straight side press having sub-plate, a bed for mounting a die, a reciprocal slide, a power drive for reciprocating said slide, and an apparatus for feeding a stock strip longitudinally onto said die;

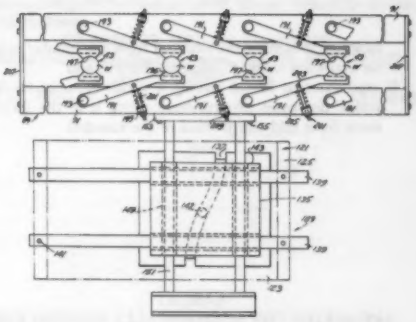
the improvement comprising a die set assembly including a lower die shoe assembly secured to said bed along its length;

a plurality of longitudinally spaced sequential dies secured upon said die shoe assembly defining a plurality of die stations;

reciprocal upper die shoe connected to said slide overlying and guidably positioned upon said lower die shoe assembly mounting a plurality of longitudinally spaced corresponding sequential punches for operative registry with said dies respectively;

a pair of spaced elongated horizontal slide bars reciprocally mounted above said lower die shoe assembly and arranged along and outwardly of said dies;

opposed pairs of workpiece gripper fingers pivotally and yieldably mounted at their one ends upon said slides respectively and at their other ends in registry with each station and adapted for engaging registry with the respective sequentially formed workpieces at each work station;



a slide bar translator mounted upon said sub-plate and secured to said slide bars for intermittently reciprocating said slide bars and fingers between adjacent stations, for sequentially transferring said workpieces through all stations;

spring means on said slide bars operatively engaging and biasing said pairs of fingers into workpiece engaging position, whereby on forward movement of said slide bars, the respective workpieces are simultaneously transferred from one station to the adjacent station and retained;

said fingers disengaging from said workpieces on retraction of said slide bars;

said spring means including a block on each slide bar;

a guide pin at one end adjustably positioned through said block;

the other end of said pin being pivotally connected to a gripper finger;

and a spring on said pin interposed between said block and finger.

4,428,222

COLD FORGING MANDREL WITH THREADS

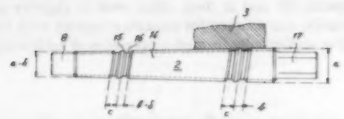
Ivan O. Ramnesten, Eskilstuna, Sweden, assignor to Förenade Fabriksverken, Eskilstuna, Sweden

Filed Jan. 22, 1982, Ser. No. 341,664
Claims priority, application Sweden, Feb. 3, 1981, 81/00773
Int. Cl.³ B21J *13/02*
U.S. Cl. 72—479 **8 Claims**

1. A mandrel insertable into a tubular forging blank for cooperation with forging hammers which repeatedly radially impact against the interior of the blank, all around it and along its length, to cold form the blank into a substantially tubular product that has an internal thread extending axially from one of its ends, said mandrel having an external thread which defines said internal thread and which extends along the mandrel from an end portion thereof that is adjacent to said end of

the blank when the hammers are acting thereon, said mandrel being characterized by:

A. said mandrel being slightly conical along the length of said external thread, with taper from its said end portion to



facilitate loosening the mandrel from the tubular product for screwing it out of said end thereof; and

B. said external thread having a width between its flanks which decreases progressively along it in the direction away from said end portion of the mandrel.

4,428,223

APPARATUS FOR PERIODICALLY TESTING THE OPERATION OF SAFETY VALVES

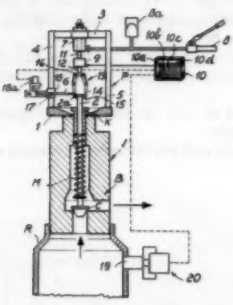
Ottavio Trevisan, Mestre, Italy, assignor to Furmanite International Limited, England

Continuation of Ser. No. 128,054, Mar. 7, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,270

Claims priority, application United Kingdom, May 16, 1978, 85525 A/78; Italy, Nov. 9, 1979, 27184 A/79; Oct. 20, 1979, 7936509

Int. Cl.³ G01M *19/00*

U.S. Cl. 73—4 R **7 Claims**



3. Apparatus for periodically testing the operation of safety valves in pressurized apparatus during normal operation of said pressurized apparatus, comprising a load-bearing structure fixedly arranged with respect to the pressurized apparatus at the position of a said safety valve, means for gripping said safety valve, a thrust-generating assembly intercoupling said gripping means and said load-bearing structure and serving to apply thrust which moves said gripping means in a direction relative to said load-bearing structure to open said safety valve, means controlling said thrust-generating assembly firstly to control opening of said safety valve and thereafter gradually reducing thrust to control closing of said safety valve, and a steplessly-operable dynamometer device associated with said thrust-generating assembly to measure valve-state change-over points at unseating and re-seating of said safety valve beng tested.

4,428,224

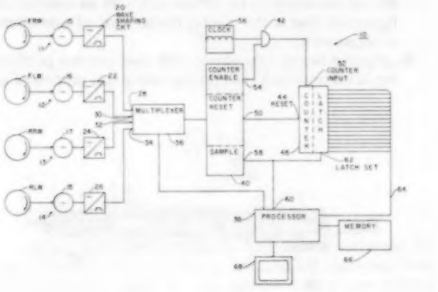
APPARATUS AND METHOD FOR TESTING OF A ROTARY MOVEMENT-ELECTRICAL SIGNAL TRANSDUCER SYSTEM

Perry Farazi, Chicago, and Howard L. Frank, Skokie, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Continuation of Ser. No. 23,462, Mar. 23, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 168,781

Int. Cl.³ G01P *21/00*

U.S. Cl. 73—2 **5 Claims**



1. A method for testing a rotary movement-electrical signal transducer system of the type generating a series of signals during operation thereof, comprising the steps of:

receiving said signals;

measuring the time of each of said signals to establish the periods therefor;

comparing said periods to determine a maximum period and a minimum period thereof;

determining an average period for said periods;

comparing said average period to said minimum period and said maximum period to provide a first evaluation interval and a second evaluation interval, respectively;

generating a reference interval;

comparing said reference interval to said first evaluation interval and said second evaluation interval; and

generating a postive test signal whenever said first evaluation interval and said second evaluation interval are less than said reference interval.

4,428,225

DEVICE FOR MEASURING THE IMBALANCE OF AN OBJECT

Shunichi Kato, Yokohama, and Tetsuo Aikawa, Chiba, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1982, Ser. No. 352,237

Claims priority, application Japan, Apr. 10, 1981, 56-51816[U]

Int. Cl.³ G01M *1/14*

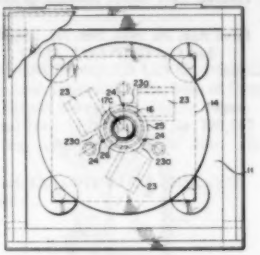
U.S. Cl. 73—65 **1 Claim**

1. A device for measuring the imbalance of a disc-like object which has a circular through-hole in the center thereof comprising:

at least three load sensors each arranged at the same distance from the center of the circular through-hole formed in said object and with the same angular interval between any two of said load sensors, and having cantilevers for supporting the object at their upper ends, said load sensors being arranged in such a way that the upper ends of said cantilevers support the object at a plurality of corresponding measuring points selected on a measuring circle which is concentric with the center of said through-hole, and that said cantilevers extend so as to be tangential to the measuring circle when viewed in the vertical direction at each of said measuring points and directed perpendicular

to the line of sight when viewed from the center of said through-hole;

a positioning means for positioning the object relative to the load sensors, said positioning means including a taper rod arranged so as to be movable up and down and having a



tapered portion fitted into the circular through-hole, and a support rod arranged so as to be movable up and down outside the taper rod; and

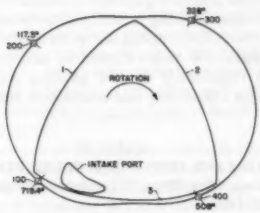
a calculator means to which outputs are supplied from said load sensors to calculate the imbalance of said object.

4,428,226

REAL TIME PRESSURE SIGNAL SYSTEM FOR A ROTARY ENGINE

William J. Rice, Elyria, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,473
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 **11 Claims**



1. Apparatus for producing a continuous pressure waveform suitable for input to an IMEP meter to indicate the IMEP of a rotary engine having a rotor with three or more faces disposed for rotation in a housing and comprising:

a plurality of pressure to voltage transducers positioned in the engine housing in communication with the interior thereof, said transducers being positioned relative to the rotor such that there are predetermined periods of overlap between each transducer and the transducer preceding it;

a plurality of averager and corrector (AAC) circuits each of which measures the instantaneous difference in pressure between one of said transducers and the preceding one during an overlap period of those transducers and produces an output signal which is offest by the average of said difference;

timing circuit means for producing pulses which correspond to predetermined positions of the rotor;

multiplexer means for receiving the output signals of said ACCs and having control inputs for receiving control address signals from said timing means whereby said AAC circuit output signals are selectively passed by said multiplexer to an output terminal; and

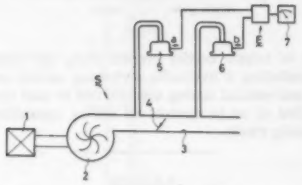
means responsive to said timing means for producing control signals for said (AAC) circuits whereby the instantaneous pressure difference between any two transducers is sampled only during an overlap period of those two transducers.

4,428,227

INTAKE PIPE PRESSURE INDICATING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

Tetsuo Yamagata, Tokyo; Morio Sato, Yokohama; Tetsuo Ogishima, Shiki, and Yoji Matsuyama, Higashiyamato, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,750
Claims priority, application Japan, May 19, 1981, 56-76289
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 **13 Claims**



1. In an internal combustion engine of a vehicle including an intake pipe provided with a supercharger and a throttle valve disposed downstream of said supercharger, an intake pipe pressure indicating system, comprising:

a first sensor which detects an internal pressure of said intake pipe downstream of said supercharger and upstream of said throttle valve and provides a first signal according thereto;

a second sensor which detects an internal pressure of said intake pipe downstream of said throttle valve and provides a second signal according thereto;

a comparator operatively connected with said first and second sensors and providing a logic signal on the basis of a comparison between at least either of said first and second signals and a predetermined reference value;

a selection circuit operatively connected with said comparator and selecting either said first or said second signal on the basis of said logic signal and providing an indication signal according thereto; and

a single indicator operatively connected with said selection circuit and adapted to receive said indication signal and effect an indication according to said indication signal.

4,428,228

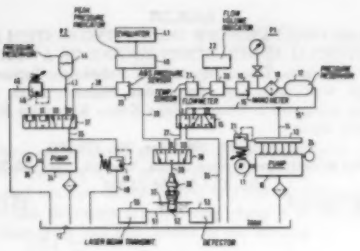
TESTING ARRANGEMENTS FOR MULTI-TESTING INJECTION NOZZLES

Werner Banzhaf, Sindelfingen; Klaus Brenner, and Ewald Eblen, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,046
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042236; Jul. 16, 1981, 3128072
Int. Cl.³ G01M *19/00, 3/08, 15/00*
U.S. Cl. 73—119 A **12 Claims**

1. A testing arrangement for testing injection nozzles in a nozzle holder combination, as to throughflow, opening pressure, buzzing condition, tightness of the nozzle holder combination, and if necessary seat tightness and needle play of a nozzle, the testing arrangement comprising receiving means arranged to receive a nozzle holder combination; control means connected to said nozzle holder combination and arranged so that a hydraulic pressure medium at constant temperature flows therethrough and comprising testing means including a first testing circuit provided with a first pump for

the hydraulic pressure medium and arranged for testing as to the throughflow, and a second circuit provided with a second pump for the hydraulic pressure medium and arranged for testing as to the opening pressure, buzzing condition, and



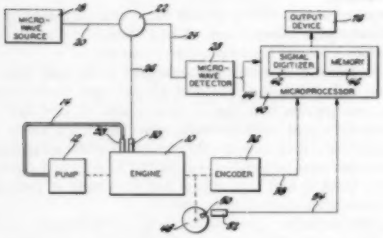
tightness of nozzle holder combination, said control means further including a hydraulic switching means connected to the first and second testing circuits and to said nozzle holder combination so as to control all testing operations during a single testing cycle.

4,428,229

MEANS FOR ESTABLISHING TIMING IN DIESEL ENGINES USING MICROWAVE INFORMATION

Robert M. Storwick, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1982, Ser. No. 383,821
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **6 Claims**



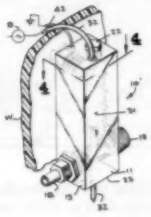
1. A method of determining the crankshaft angle at which a poppet type fuel injector of a diesel engine opens to inject fuel into the combustion chamber of the engine relative to the top dead center position of the piston of the engine, the steps of comprising, while the engine is running supplying a microwave signal to the combustion chamber thereof and detecting the reflected waveform, the frequency of the microwave signal being such that the amplitude of the detected reflected waveform is a function of engine crank angle, has portions that are substantially symmetrical about top dead center over crankshaft angles located outboard of top dead center and has an asymmetric portion due to injector poppet opening movement located between the symmetrical portions, sampling the amplitude of the reflected waveform by two data windows that are spaced sufficiently as to exclude the asymmetric portion of the waveform when the windows are centered about top dead center, shifting the windows until the data sampled by the windows is substantially symmetrical thereby identifying a crankshaft position corresponding to top dead center, placing the windows in a position in which they are centered about top dead center to detect predetermined portions of the waveform which may include asymmetrical data, and then varying the space between the windows until the windows detect a transition from asymmetric to asymmetric data or vice versa thereby identifying the crank angle at which the injector poppet opened.

4,428,230

FLOW GAUGE IONIZER

Anthony Q. Testone, Lee, Mass., assignor to Static, Inc., Skippack, Pa.

Filed Apr. 28, 1981, Ser. No. 258,307
Int. Cl.³ G01F *1/22, 15/00*
U.S. Cl. 73—198 **8 Claims**



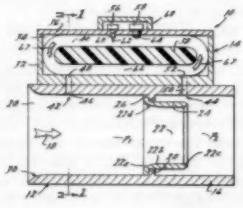
1. In combination,
(a) a gas volume flow gauge comprising:
(i) a body,
(ii) gas passage means in said body comprising a bore providing a substantially vertical passage,
(iii) means for indicating the gas volume flow rate including a float in said substantially vertical passage,
(iv) means for varying the gas volume flow rate, and
(b) means for ionizing gas passing from said gauge comprising ionizing point means in said gas passage means, means for supplying alternating current to said ionizing point means comprising a conductor adapted to be connected to a source of alternating current, a second bore in said body, said conductor being in said second bore, means carried by said body for coupling said point means to said conductor, conductive means carried by said body in adjacent spaced relationship to said ionizing point means, and means for connecting said conductive means to ground.

4,428,231

VISCOUS LINK DRIVE FOR FLUID FLOWMETER

Kirk B. Peloza, Glen Ellyn, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 30, 1981, Ser. No. 325,782
Int. Cl.³ G01F *5/00*
U.S. Cl. 73—202 **27 Claims**



1. A fluid flowmeter comprising:
means defining a passage for the flow of a fluid therethrough;
flow restriction means within said passage and operative to establish a fluid pressure differential thereacross as a function of said fluid flow;
means defining a closed recirculation path disposed adjacent

said passage and in fluid communication therewith through an inlet port upstream of said restriction means and an outlet port downstream of said restriction means; and

sensing means operative to monitor fluid flowing in said recirculation path and to generate a fluid condition signal as a function thereof.

4,428,232

CAPACITANCE LIQUID LEVEL DETECTOR

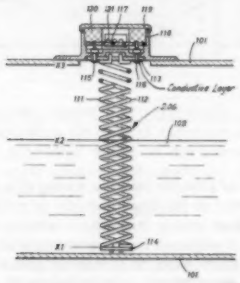
Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 12, 1981, Ser. No. 320,567

Claims priority, application Japan, Nov. 20, 1980, 55-167133[U]

Int. Cl.³ G01F *23/26*; H05K *1/18*

U.S. Cl. 73—304 C **4 Claims**



1. An electric liquid level detector for detecting a level of liquid within a container, comprising:

a pair of helically coiled electrodes extending vertically in said container and being fixed at their one ends to an upper portion of said container and at their other ends to a bottom of said container, said electrodes being positioned such that they are at least partially submerged by any liquid stored within said container and such that the amount of submersion is a function of liquid level within the container; and

an oscillator circuit of the resistance capacity type including a variable condenser which is formed at least in part by said electrodes, said oscillator circuit being arranged to oscillate at a frequency that is a function of capacitance between said electrodes so as to indicate the level of the stored liquid,

said oscillator circuit comprising;

a first inverter connected to an electric DC power source;

a second inverter connected to said electric DC power source and having an input terminal connected to an output terminal of said first inverter;

a resistor connected in series with said first inverter to form a closed circuit, said variable condenser being connected at one end thereof with an output terminal of said second inverter and at the other end thereof with the output terminal of said first inverter through said resistor such that said first and second inverters are inverted opposite to each other with a time period defined by a resistance value of said resistor and an electro-static capacitance of said variable condenser;

a third inverter connected to said electric DC power source and connected at its input terminal to the output terminal of said second inverter; and

a second condenser connected at one end thereof with an output terminal of said third inverter and at the other end thereof with the output terminal of said second inverter through said variable condenser such that said second condenser is biased by an inverter function of said third inverter in voltage polarity opposite to that of said variable condenser.

4,428,233

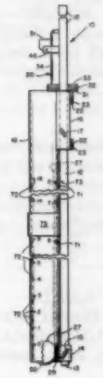
GAUGE FOR MEASURING DEPTH OF FLOWING FLUID

Lewis G. Lynn, 65 Hillhurst La., Rochester, N.Y. 14617

Filed Nov. 7, 1979, Ser. No. 91,941

Int. Cl.³ G01F *23/08*

U.S. Cl. 73—315 **10 Claims**



1. A portable gauge for measuring the depth of fluid flowing in an open conduit of known configuration, or past a flume or weir in a generally horizontally disposed conduit, comprising

a hand-held, portable support disposed to be inserted manually into a conduit with its lower end releasably resting on the bottom surface of said conduit,

a transparent, tubular well open at each end and having a float movable in its bore,

means for adjustably mounting said well on said support for vertical adjustment thereon relative to said lower end of said support, said well disposed to be held vertically by said support with its lower, open end positioned a predetermined distance above the bottom of said conduit to permit fluid from the conduit to enter the well and elevate said float,

a graduated scale on said well indicating the height of the float above said lower end of the well, when the float is floating on the fluid which enters, the lower end of said well, and calibrated to provide a direct reading of the depth of the fluid flowing in said conduit, and

clamping means extending into said well and operable, when said float is floating in said well releasably to clamp said float against further movement in the well, whereby after the support is withdrawn from the conduit the clamped float may be read against the scale on said well.

4,428,234

PHASE DETECTION LASER ACCELEROMETER

Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803

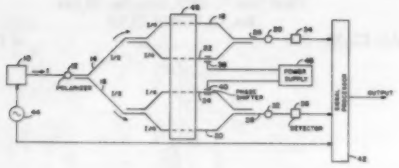
Filed Mar. 25, 1982, Ser. No. 362,014

Int. Cl.³ G01P *15/08*

U.S. Cl. 73—517 R **6 Claims**

1. A phase detection laser accelerometer comprising: a laser for generating a beam of coherent light, polarizing means disposed in the path of said beam of light for providing a polarized light beam output, first and second photodetectors, optical waveguide means made of a material having a refractive index that changes in response to stress for passing coherent light therethrough and for splitting and directing said polarized light beam into a plurality of beams, a proof mass disposed on said waveguide means for selectively stressing

portions of the waveguide means in response to acceleration acting on the proof mass, first and second of said beams being directed through said waveguide means as inputs to said first and second photo-detectors respectively, third and fourth of said beams being directed through said waveguide means to



said first and second photodetectors respectively, said first and third beams being coincident and said second and fourth beams being coincident at said detectors, and signal processing means adapted to receive inputs from said photodetectors for providing a difference signal output in response to acceleration forces on said proof mass.

4,428,235

NON-DESTRUCTIVE INSPECTION BY FREQUENCY SPECTRUM RESOLUTION

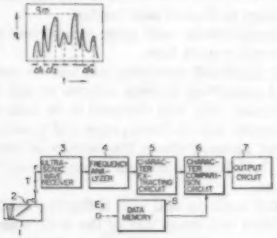
Sakae Sugiyama, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,428

Claims priority, application Japan, Jun. 20, 1980, 55-84215; Aug. 20, 1980, 55-115120

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—579 **9 Claims**



1. In a method of inspecting non-destructively a specimen for examining the presence or absence of a defect in said specimen, in which an ultrasonic wave is emitted from a probe and a reflected wave from said specimen is received by said probe whose output signal is processed to determine the presence or absence of said defect, said processing comprising:

deriving a frequency spectrum signal representative of the freuency spectrum of said output signal;

deriving at least two separate characteristic parameter signals of the frequency spectrum from said frequency spectrum signal, said characteristic parameters including a maximum spectrum density and a standard deviation of frequency spacing between maxima in the frequency spectrum of said frequency spectrum signal;

comparing said characteristic parameter signals with reference signals representative of predetermined corresponding characteristic parameters of maximum spectrum density and a standard deviation of frequency spacing between maxima in the frequency spectrum for both a defect and a boundary in a similar reference material; and

discriminating between a defect and a boundary based upon said step of comparing.

4,428,236

METHOD OF ACOUSTIC EMISSION TESTING OF STEEL VESSELS OR PIPELINES, ESPECIALLY FOR NUCLEAR REACTOR INSTALLATIONS

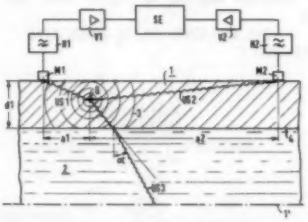
Erwin Votava, Pforzheim; Günter Stipsits, Neunkirchen, and Richard Sommer, Bamberg, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 25, 1981, Ser. No. 305,512

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036951

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—587 **8 Claims**



1. Method of acoustic-emission testing of a steel component such as a vessel or pipeline especially of primary circulatory loops of nuclear reactor installations wherein the component, on one hand is subjected to a pressure medium, such as water, and, on the other hand, to ultrasonic pulses emitted during deformation development resulting from growth of cracks therein or from leaks and transmitted through the component, which comprises detecting and amplifying the ultrasonic pulses with equipment, respectively, formed of test probes, which are disposed so as to determine respective sources of acoustic emission due to differences in transmission time of the ultrasonic pulses through the component, and of electronic amplifiers operatively associated with the test probes, and then feeding a resultant amplified defect signal from the equipment to a display, the equipment being tuned to reception of a frequency band of acoustic-emission spectrum which is above a limiting frequency f_G defined by the relationship:

$$5.9 \leq \frac{f_G \cdot d}{\text{MHz} \cdot \text{mm}} \leq 6.0,$$

wherein d is the wall thickness of the component being tested.

4,428,237

SYSTEM AND METHOD FOR MEASURING ULTRASONIC RETURN SIGNALS

Andrew E. Zeger; Burton S. Abrams, both of Wyndmoor; Joseph L. Rose, Churchville; Michael J. Avioli, Jr., Havertown, all of Pa., and Gurvinder P. Singh, San Antonio, Tex., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 13, 1980, Ser. No. 206,626

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—592 **16 Claims**

1. In a system for analyzing output signals from an ultrasonic test instrument representing ultrasonic return signals characterizing a structure being examined,

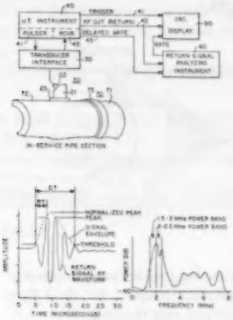
partial power circuit means for measuring the partial amount of signal power in at least a first preselected band of the frequency spectrum of said return signal and producing a corresponding first partial power band signal;

waveform circuit means for measuring at least one preselected feature of the waveform of said return signal and producing a corresponding waveform feature signal;

combining circuit means for performing a preselected algo-

rithmic combination of said first partial power band signal and said waveform feature signal to produce a test statistic signal; and

decision circuit means for registering a decision on a preselected characteristic of said structure based on the value of



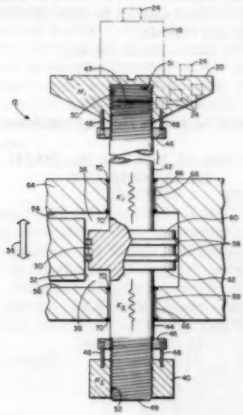
said test statistic signal; and algorithmic combination being preselected on the basis of experimental data demonstrating a substantial degree of discrimination in said test statistic signal value for said preselected characteristic of said structure.

4,428,238

VIBRATING TEST SCREENING APPARATUS

Robert Tauscher, Hacienda Heights, Calif., assignor to Team Corporation, South El Monte, Calif.

Filed Oct. 5, 1981, Ser. No. 308,735
Int. Cl.³ B06B *3/00*
U.S. Cl. 73—663 **2 Claims**



1. Apparatus for subjecting a test specimen to vibrational forces, comprising:

a base;

first and second preselected masses;

means for mounting the first and second masses for reciprocal movement relative to the base;

means for attaching a test specimen to the first mass for movement therewith;

means for actuating the first and second masses reciprocally;

the mounting means comprising first and second rods extending substantially parallel to the direction of reciprocal movement to elastically couple the actuating means to the first and second masses, respectively;

means for threading the first and second masses onto the first and second rods, respectively; and

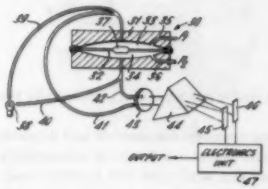
means for locking the masses at preselected locations on the rods, the locking means including a pair of collars threaded onto the respective rods and means for urging the first and second masses axially relative to the collars.

4,428,239

DIFFERENTIAL PRESSURE MEASURING APPARATUS

James S. Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, England

Filed Oct. 26, 1981, Ser. No. 314,851
Claims priority, application United Kingdom, Oct. 27, 1980, 8034483
Int. Cl.³ G01L *9/00*
U.S. Cl. 73—705 **18 Claims**



1. Apparatus for measuring differential pressure comprising a transducer having a body and a diaphragm mounted in the body to be displaced relative to the body by a differential pressure to be measured applied across the diaphragm so that the displacement is indicative of the pressure difference, and means for measuring the displacement of the diaphragm, wherein at least a surface region of the diaphragm is reflective and the means for measuring comprises a partially reflecting surface fixed relative to the body adjacent said surface region of the diaphragm to form therewith an interferometer arrangement, means for directing light towards said region of the diaphragm through the partially reflecting surface to illuminate the interferometer arrangement to produce interference between the light reflected by the diaphragm and the light reflected by the partially reflective surface during a measurement period, the illuminating light having a multiplicity of predetermined frequencies during the measurement period comprising a band of frequencies, detector means arranged to be responsive to said interfering reflect...l light to provide an output indication of the amplitude variation with frequency of the interfering reflected light within said band of frequencies.

4,428,240

METHOD FOR DETERMINING MAGNITUDE OF LOAD IN AN ELONGATED BOLT HAVING AN ELASTICALLY DEFORMABLE HEAD

Knut C. Schoeps, Tyresö, Sweden, assignor to Atlas Copco AB, Nacka, Sweden

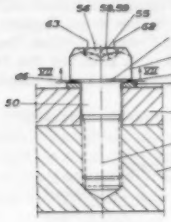
Division of Ser. No. 93,911, Nov. 13, 1979. This application Jun. 14, 1982, Ser. No. 388,139
Claims priority, application Sweden, Nov. 13, 1978, 7811678
Int. Cl.³ F16B *31/02*
U.S. Cl. 73—761 **2 Claims**

1. Method for determining the actual load magnitude in an elongated bolt having a head which is elastically deformable in a known relation to the bolt load magnitude, the head having a transverse weakening slot extending substantially in the direction of the longitudinal axis of the bolt; a circular cylindrical depression substantially coaxial with said longitudinal axis and extending from the top of the head to a depth smaller than the depth of said slot; a pair of diametrically opposed measure points disposed along a straight line extending perpendicular to

the lengthwise direction of said slots and on opposite sides of said slot; and a pair of diametrically opposed reference points (62,63) located on said peripheral wall of said cylindrical depression (56) and disposed along a straight line (61) extending substantially parallel to said slot (55) such that the relative distance between the reference points (62,63) remains substantially unaffected by the axial load transmitted by the bolt;

comprising the steps of:

(a) measuring a first diameter of said depression between said



reference points in a direction substantially parallel to said slot;

(b) measuring a second diameter of said depression between said measure points in a direction substantially perpendicular to said slot while said bolt is under load; and

(c) determining the load responsive bolt head formation by calculating the difference between said measured first diameter and said measured second diameter, said load responsive bolt head deformation being a predetermined function of said calculated difference.

4,428,241

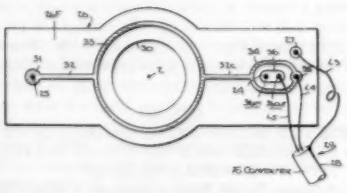
ELECTRODE WIRING HARNESS FOR MAGNETIC FLOWMETER

James W. Davis, New Britain, and Michael E. Dalbey, Warrington, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Nov. 6, 1981, Ser. No. 318,924

Int. Cl.³ G01F *1/60*

U.S. Cl. 73—861.12 **10 Claims**



1. An electrode harness for an electromagnetic flowmeter provided with a lined, non-magnetic spool which defines a flow conduit for the fluid to be metered, a pair of electrodes mounted on said spool at diametrically-opposed positions along an axis normal to the axis of symmetry of an electromagnetic assembly which establishes a pulsating magnetic field in the conduit whereby the fluid intercepting this field induces a signal in the electrodes which is conducted by the harness to an external converter; said harness comprising a printed circuit having a conductive pattern thereon providing wiring from the electrodes to the converter in a configuration causing voltages induced in the wiring by the magnetic field to cancel out, whereby the signal fed to the converter is free of spurious components.

4,428,242

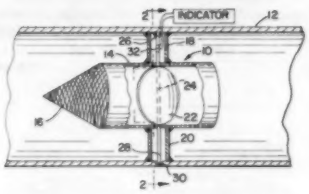
FLOWMETER USING TWISTING TORQUE

John R. Holstrom, Montgomery, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 11, 1982, Ser. No. 357,261

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.75 **1 Claim**



1. A flow rate measuring device comprising:

a cylindrical conduit adapted for fluid flow therethrough along longitudinal axis thereof,

a torque detecting member of a disc shape,

a rod shaped attachment means fixedly attached to and passing through the center of said torque detecting means,

said attachment means having one end fixedly attached to said conduit so as to support said torque detecting member in a predetermined acute angle to said longitudinal axis of said conduit,

strain gauge type torque measuring means affixed to said attachment means and display means operatively connected to said torque measuring means,

said torque detecting member adapted to transmit directly to said attachment means the force of a fluid flowing through said conduit in the form of a torque,

said torque measuring means utilizing said torque to transmit a signal to said display means whereby said signal will be converted to a visual display in units of rate of flow of fluid through said conduit.

4,428,243

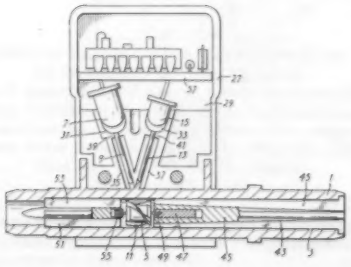
FLOWMETERS

Lionel I. A. Taylor, Copythorne House, Copythorne, Southampton, England

Filed Nov. 13, 1981, Ser. No. 321,312

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.77 **8 Claims**



1. A flowmeter comprising a bladed rotor element mounted in a bore formed in a body so that fluid flowing through the bore causes the element to rotate at a speed representative of the rate of flow of the fluid, a source of electromagnetic radiation, means for directing radiation from the source into the bore and towards the rotor element so that a radially outer face of at least one rotor blade moves across the path of the radia-

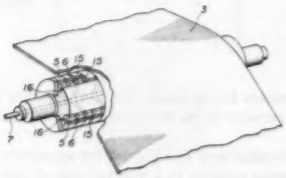
tion during each rotation of the rotor element, a detector of electromagnetic radiation, and means for directing radiation reflected by the said face of each blade to the detector, the means for directing radiation from the source and the means for directing reflected radiation comprising at least one elongated guide member having a refractive index greater than the refractive index of the medium in which the member is disposed, each guide member being formed integrally with at least a portion of the said body.

4,428,244

APPARATUS FOR MEASURING INTERNAL STRESS OF STRIP DURING ROLLING PROCESS

Yukiyasu Takeda, Nagoya, Japan, assignor to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,606
Int. Cl.³ G01L *5/04*
U.S. Cl. 73—862.07 **7 Claims**



1. An apparatus for measuring the internal stress generated in a strip in the width direction thereof in the course of rolling process thereof, comprising:

a plurality of separate, ring-shaped stress detection mechanisms arranged coaxially with each other and side-by-side with small gaps therebetween, said stress detection mechanisms being adapted to contact the surface of the strip passing thereon under tension, each of said stress detection mechanisms having a stress detection means therein for detecting the internal stress during passage of the strip over said stress detection mechanism; and

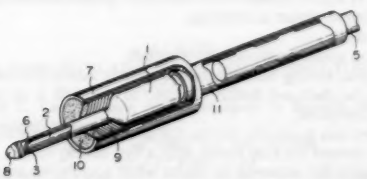
a gas ejection mechanism for ejecting gases through said gaps between said ring-shaped stress detection mechanisms in order to prevent rolling oil from penetrating into said gaps.

4,428,245

APPARATUS FOR SAMPLING MOLTEN METAL

Hajime Nakamura, Kure; Junichi Iwamura; Yoshio Nakajima, both of Hiroshima, and Masaji Hasegawa, Kure, all of Japan, assignors to Nisshin Steel Company Limited, Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,461
Claims priority, application Japan, Mar. 31, 1981, 56-45869[U]; Jun. 24, 1981, 56-93387[U]; Jun. 24, 1981, 56-97959
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.52 **12 Claims**



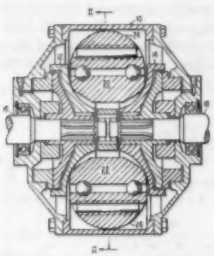
1. A vacuum sampling container which comprises a small diameter cylindrical section and a large diameter cylindrical section coaxially connected in mutual communication and evacuated and sealed, the free end of said small diameter cylindrical section being provided with a portion thinned to the extent that it is broken when the vacuum sampling container is immersed in a molten metal, said container being quartz.

4,428,246

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Paul L. Horton, Austin, Tex., and Okoshi Hideo, Fujisawa, Japan, assignors to Excelermatic Inc., Austin, Tex. and Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,281
Int. Cl.³ F16H *15/40, 15/08*
U.S. Cl. 74—200 **7 Claims**



1. An infinitely variable traction roller transmission comprising: coaxial input and output shafts; a toric disc supported by each of said shafts for rotation therewith, said toric discs being disposed opposite, and in spaced relationship from, each other so as to form a toroidal cavity therebetween; at least two motion transmitting traction rollers disposed in radial symmetry in said toroidal cavity between, and in engagement with, said toric discs so as to be capable of transmitting motion from one to the other of said toric discs; a pivotal support structure for each of said traction rollers; a support block rotatably supporting said traction roller at one side thereof and having at its opposite side a bearing surface supported on a cooperating bearing surface formed on said pivotal traction roller support structure with cam means provided at the interface of said cooperating bearing surfaces for supporting each support block and associated traction roller on its pivotal support structure laterally movably essentially in the direction of the pivot axis of said support structure, said cam means being adapted to convert lateral movement of said support blocks relative to said support structure into movement of said support block and traction roller toward said toric discs such that said traction roller is also moved into firmer engagement with said toric discs with a force corresponding to a torque transmitted by the traction roller between the toric discs.

4,428,247

TRANSMISSION

Robert A. Young, Benton, Ark., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1981, Ser. No. 288,858
Int. Cl.³ F16H *3/08*; F16D *21/02*
U.S. Cl. 74—331 **15 Claims**

1. A change gear transmission clutch structure comprising:

a rotatable shaft;

a first gear coaxially surrounding said shaft and rotatable relative thereto;

a second gear coaxially surrounding said shaft and rotatable relative thereto, said second gear having central opening therethrough, said second gear axially spaced from said first gear in a first axial direction;

a third gear coaxially surrounding said shaft and rotatable relative thereto, said third gear having central opening therethrough, said third gear axially spaced from said

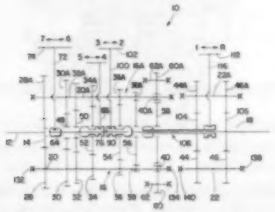
second gear in said first axial direction whereby said second gear is axially interposed said first and third gears;

a fourth gear coaxially surrounding said shaft and rotatable relative thereto, said fourth gear axially spaced from said third gear in said first axial direction whereby said third gear is axially interposed said second and fourth gears;

said first, second, third and fourth gears each carrying clutch teeth fixed thereto; and

means for selectively clutching said gears one at a time to said shaft, said clutching means comprising:

a first tube clutch splined to said shaft for rotation therewith and axial movement relative thereto, said first tube clutch comprising an elongated first tube portion surrounding said shaft and received through the central opening in said second gear, a first bi-directional clutch tooth portion normally axially interposed the clutch teeth of said first and second gears and a first shift fork receiving portion axially interposed said second and third gear for engagement by a first shift fork, said first bi-directional clutch



portion engageable with said first gear clutch upon axial movement of said first tube clutch in the second axial direction and engageable with the second gear clutch teeth upon axial movement of said first tube clutch in said first axial direction, and

a second tube clutch splined to said shaft for rotation therewith and axial movement relative thereto, said second tube clutch comprising an elongated second tube portion surrounding said shaft and received through the central opening in said third gear, a second bi-directional clutch tooth portion normally axially interposed the clutch teeth of said third and fourth gears and a second shift fork receiving portion axially interposed said first shift fork receiving portion of said first tube clutch and said third gear for engagement by a second shift fork, said second bi-directional clutch portion engageable with said third gear clutch teeth upon axial movement of said second tube clutch in the second axial direction and engageable with said fourth gear clutch teeth upon axial movement of said second tube clutch in the first axial direction.

4,428,248

SHIFTING ACTUATOR

Robert H. Brouckson, Danville; George Martin, Lancaster, and Richard J. Oster, Danville, all of Ky., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1981, Ser. No. 255,581

Int. Cl.³ F16D *21/02;* **B60K** *20/10;* **F16H** *25/16*

U.S. Cl. 74—335 **20 Claims**

1. A shift actuator for selectively shifting a shift member to a selected one of a least two axially separated positions, said actuator comprising:

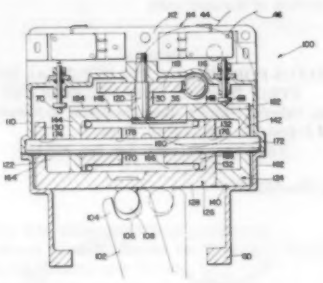
a housing;

means for engaging said shift member axially slidable in said housing, said means for engaging said shift member effective to engage said shift member and move said shift member axially therewith;

reaction means axially slidable in said housing, said reaction means axially movable relative to said means for engaging said shift member;

a resilient biasing means retained in said housing between said means for engaging said shift member and said reaction means;

a rotational member rotatably mounted in said housing, said rotational member having at least one unique rotational position relative to said housing for engaging said reaction means and positively moving said reaction means to an axial position effective to cause said biasing means to urge



said means for engaging said shift member to move said shift member to each of said axially separated positions; and

means mountable to said housing for selectively rotating said rotational member to a selected one of said unique rotational positions, said means for selectively rotating said rotational member comprising an unidirectional rotational motor.

4,428,249

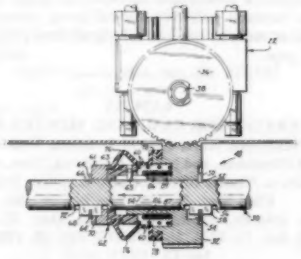
GEAR TORQUE SENSOR APPARATUS

Keith L. Henk, Brooklyn Park, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Dec. 4, 1981, Ser. No. 327,520

Int. Cl.³ F16H *1/02, 57/00;* **F16D** *11/00, 23/00*

U.S. Cl. 74—412 TA **15 Claims**



1. In a drive system of a processor of photosensitive material, the improvement comprising:

a shaft;

stop means positioned on the shaft;

a gear having helical teeth and slidably axially positioned on the shaft and fixedly attached to the shaft in an angular direction;

first bias means for biasing the gear in a first axial direction toward the stop means with a first biasing force;

means for actuating an alarm when a sufficient amount of torque resisting rotation of the gear develops to overcome the first biasing force, and the gear slidably moves a first predetermined distance in a second opposite axial direction;

second bias means for biasing the gear in the first axial direc-

tion and in combination with the first bias means providing a second biasing force greater than the first biasing force; and

means for permitting the gear to rotate freely in the angular direction when the torque exceeds the second biasing force and the gear has moved a second predetermined distance in the second axial direction.

4,428,250

ELECTRIC DRIVE, PARTICULARLY FOR A WINDOW LIFTING MECHANISM IN A MOTOR VEHICLE

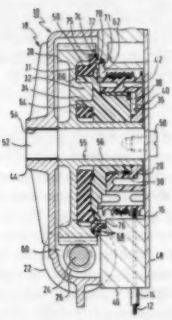
Herbert Becker, Coburg; Manfred Sünkel, Sonnefeld; Volker Grams, Coburg, and Gerhard Schelhorn, Untersiemau, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Dec. 23, 1980, Ser. No. 220,009

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1979, 2952408

Int. Cl.³ B66D *1/12*

U.S. Cl. 74—425 **10 Claims**



1. Device for driving a rope-like power transmission member for a window-lifting mechanism, such as in a motor vehicle, comprising a casing, a worm rotatably supported within said casing, an electric motor arranged to drive said worm, a worm gear located within said casing and in engagement with said worm, a rope drum disposed within said casing and having a rope wrapped on said drum, a coupling part positioned within said casing for interconnecting said drum and said worm gear, said casing having an opening for moving said rope out of said casing, wherein the improvement comprises a sealing plate located between said worm gear and said coupling part and dividing the interior of said housing into a first partial space containing said worm and worm gear and a second partial space containing said drum and coupling part, said sealing plate is disposed in form-locking engagement with said worm gear, said sealing plate has an annular area thereon facing toward said drum and said annular area on said sealing plate is in contact with an annular area on the inner surface of said casing, and said sealing plate includes at least one sealing lip disposed in contact with said worm gear.

4,428,251

AUTOMATIC ADJUSTMENT MECHANISM FOR A CABLE DRIVE

Daniel F. Last, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

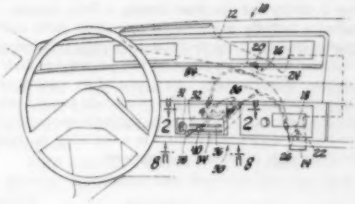
Filed Apr. 14, 1982, Ser. No. 368,428

Int. Cl.³ F16C *1/10*

U.S. Cl. 74—501.5 R **2 Claims**

1. In a system including a driving member coupled to a driven member through a flexible cable having a wire connected between the members and a surrounding sheath which is secured so that the wire is movable within the sheath to move the driven member toward a limit position of its travel as the driving member is moved toward a limit position of its travel, apparatus for calibrating the system upon initial movement of the driving member to its limit position so that thereafter the driven member is calibrated to reach its limit position as the driving member reaches its limit position, the apparatus comprising:

holding means including a guide member engaging one end of said sheath for slidably restraining the same along the axis of said cable so that as the driving member is initially moved toward its limit position, said holding means restrains the one end of the sheath permitting movement of the wire relative to the sheath to move the driven member to its limit position, after which further movement of the driving member toward its limit position overcomes such restraint so that said wire and sheath move together relative to said guide member until the driving member reaches its limit position, said holding means further including a locking member actuable to secure the one end of the sheath to said guide member; and



a calibration member connected to said driving member for movement therewith and effective when said driving member is initially moved to its limit position to actuate said locking member to secure the sheath near the one end thereby defining a final position of the one end of the sheath so that in subsequent operation of the system, the driven member reaches its limit position as the driving member reaches its limit position.

4,428,252

ACTUATOR DEVICE FOR OPENING A SLIDING DOOR

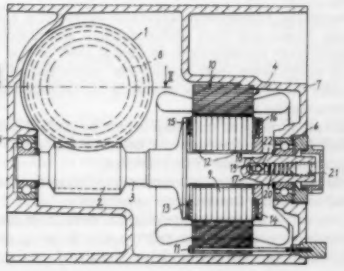
Giuseppe Manini, Via Malavezzi, 26, Casalecchio Di Reno (Province of Bologna), Italy

Filed May 4, 1981, Ser. No. 260,136

Claims priority, application Italy, Nov. 19, 1979, 4995/79[U]

Int. Cl.³ E05F *15/10*

U.S. Cl. 74—625 **2 Claims**



1. An actuator device for opening a sliding door comprising a casing, a driven shaft rotatably carried in said casing, a pinion gear keyed on said driven shaft and in mesh engagement with a rack rigid with the sliding door, a drive shaft rotatably supported in said casing, an electric motor having a rotor mounted

on said drive shaft to rotate with respect thereto and arranged between a pair of plates, one of said plate being rigid with said drive shaft and the other of said plates being rotatably coupled to but axially movable with respect to said driveshaft, an adjustable spring adapted to cause said rotor to be clamped between said plates with a preset force, a worm screw rigid with said drive shaft and in mesh engagement with an helical gear wheel mounted on said driven shaft, wherein according to the improvement said driven shaft has a diametrically throughout slot wherethrough a pin is inserted the opposite ends whereof project out of said slot and engage in a diametrical groove on the hub of the helical gear wheel, said pin being caused to bear against said hub by a spring bearing on said pin with the interposition of a cap, and wherein within the casing and coaxially with said driven shaft, there is formed a tubular portion threadably accommodating a cylinder provided with a ring nut and having a cavity for accommodating a lock therein, said lock including a radially movable bit operative, with said cylinder in a partly threaded out position, to engage with an opening in said tubular portion, in the end of said driven shaft adjacent said tubular portion there being formed an axial bore open on one side to said slot and on the other side to said tubular portion and wherethrough a stem is slidingly movable and effective to cause, with said cylinder in a threaded in position, said pin to disengage from said hub groove.

4,428,253

AUTOMATIC TRANSMISSION WITH OVERDRIVE DEVICE

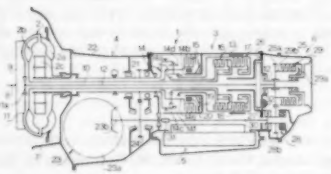
Masayuki Kodama, Hachioji, and Toshio Takuno, Hamuramachi, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 297,887

Claims priority, application Japan, Sep. 9, 1980, 55-125438

Int. Cl.³ F16H *47/08*

U.S. Cl. 74—688 **14 Claims**



1. An automatic transmission comprising

a torque converter comprising a converter cover and an impeller connected to a crankshaft of an internal combustion engine and a turbine driven by said impeller through oil,

an automatic transmission apparatus comprising a planetary gear device and fluid operated brake and clutch devices operatively connected to an output shaft of said turbine,

an oil pump drive shaft operatively connected to said converter cover and axially extending through said automatic transmission apparatus,

means comprising an oil pump driven by said oil pump drive shaft for producing pressure oil to be applied to the fluid operated brake and clutch devices,

a final reduction gear device connected to an output shaft of said automatic transmission apparatus,

an overdrive device comprising an overdrive clutch and overdrive gears, said overdrive clutch being connected between said oil pump drive shaft and said overdrive gears,

an intermediate shaft connected between an output shaft of said overdrive gears and said final reduction gear device, and

valve means for applying the pressure oil to said overdrive clutch for engagement thereof for overdriving and substantially simultaneously via one of said clutch devices for operatively disconnecting said output shaft of said turbine from said final reduction gear device via said automatic transmission apparatus and said planetary gear device.

4,428,254

PLANETARY TRANSMISSION

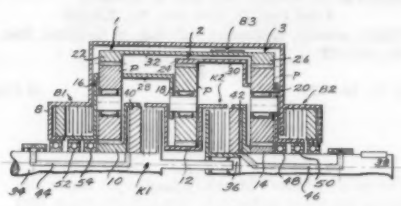
Bernd-Robert Hohn, Kosching, Fed. Rep. of Germany, assignor to Audi NSU Auto Union AG, Ingolstadt, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 192,039

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939623

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—765 **10 Claims**



1. A transmission comprising: an input shaft and an output shaft rotatable about a common axis; first, second and third planetary gear sets each having a sun gear, a ring gear coaxial with and rotatable about the sun gear and planetary gear means including planetary gears engaging the sun gear and the ring gear and a planetary carrier supporting said planetary gears; a rigid rotatable first coupling connecting the ring gears of said first and third planetary gear set; a rigid rotatable second coupling connecting the planetary carrier of said first planetary gear set with the planetary carrier of said second planetary gear set; a third coupling connecting the planetary carrier of said third planetary gear set with or said ring gear of said second planetary gear set; a brake means for each coupling; a first clutch means for selectively connecting the sun gear of said second planetary gear set with said input shaft; a second clutch means for selectively connecting said sun gear of said second planetary gear set with said output shaft; the sun gear of said first planetary gear set being rigidly connected with said input shaft and the sun gear of said third planetary gear set being rigidly connected with said output shaft.

4,428,255

LOCK PIN ASSEMBLY

Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00328, § 371 Date Mar. 16, 1981, § 102(e) Date Mar. 16, 1981, PCT Pub. No. WO82/03194, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 16, 1981, Ser. No. 277,750

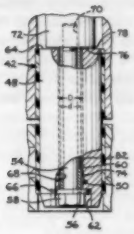
Int. Cl.³ B23Q *17/00;* **E02F** *3/14*

U.S. Cl. 74—813 L **7 Claims**

1. In an indexable apparatus (10) having a first member (34) having a pin receiving portion (94) and a second member (36) having a locking assembly (42) including a lock pin (48), said members (34,36) being supported for relative rotation, and means (44) for moving said locking assembly (42) into engagement with said receiving portion (94), the improvement comprising:

means (50) for securing said lock pin (48) to said moving means (44) and providing controlled radial and axial motion of said lock pin (48) relative to said moving means (44), said lock pin (48) having a through bore (60) having a diameter D, said means (50) including a spacer (52) and a threaded fastener (54) extending through said bore (60)

with said fastener (54) engaging said moving means (44), said spacer (52) having a diameter d which is less than the



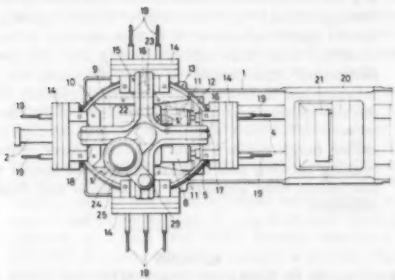
diameter D of said bore (60), said spacer (52) and said bore (60) defining a controlled annulus (74).

4,428,256

GENEVA GEAR APPARATUS FOR DRIVING AN INDEX TABLE

Jinsei Ida, Sayama; Yoshio Hagimoto, Niiza, and Tsutomu Fujita, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,218
Claims priority, application Japan, Jul. 3, 1980, 55-90004
Int. Cl.³ B23Q *3/157*
U.S. Cl. 74—820 4 Claims



1. An apparatus for driving an index table comprising:

a first shaft;

an index table rotatably mounted on the first shaft, the table having grooves therein forming a Geneva gear, the grooves having force bearing walls comprising straight portions and sector portions; and

means for driving the table in rotation including a drive motor, a second shaft driven by the motor an axis, a crank mounted on the second shaft, and a Geneva pin mounted on the crank having an axis and a circumferential surface, the pin being engaged in the grooves in the table to effect stepwise rotation of the table to equispaced, predetermined angular posisions; wherein

the second shaft and the grooves are spaced from each other such that the distance from the axis of the second shaft to the nearest portion of the circumferential surface of the pin is less than the distance from the axis of the second shaft to the straight portions of the force bearing walls of the grooves and wherein the sector portions of the force bearing walls of the grooves are recessed such that the distance from the axis of the second shaft to the nearest portion of the circumferential surface of the pin is equal to the distance from the axis of the second shaft to the sector portions of the force bearing walls of the grooves,

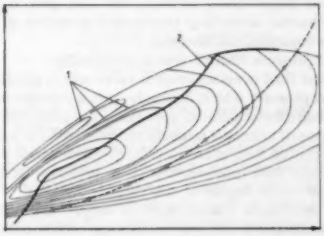
so that the circumferential surface of the pin transfers from bearing against the wall of a straight portion to bearing against the wall of a recessed sector portion of the groove prior to the index table finishing rotation to one of the predetermined angular positions, and the index table completes rotation to the predetermined angular position powered solely by its inertia.

4,428,257

MOTOR VEHICLE CONTROL FOR AN INFINITELY VARIABLE TRANSMISSION

Michael Meyerle, Meckenbeuren, and Friedrich Ehrlinger, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 181,081
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934270
Int. Cl.³ B60K *41/12, 41/26*
U.S. Cl. 74—866 10 Claims



1. An automatic control system for an infinitely variable transmission driven by an internal combustion engine of a motor vehicle having an accelerator pedal for controlling an accelerator having a throttle valve of said engine, said system comprising;

means for generating an accelerator travel signal representing the displacement of said accelerator;

a servo-adjusting device connected between said accelerator pedal and said transmission for controlling the ratio selection thereof, said servo-adjusting device including:

a servo-valve provided with an adjustment regulating line acting on said valve in one direction and means responsive to engine speed for acting on said valve in another direction,

a servomotor in fluid connection with said valve and connected to said transmission for changing the ratio thereof in response to operation of said valve, and

means mechanically coupling said valve with said servomotor for readjusting the position of said valve in response to the displacement of said servomotor;

a throttle valve control line operatively connecting said accelerator pedal with said accelerator for the delivery of said signal thereto; and

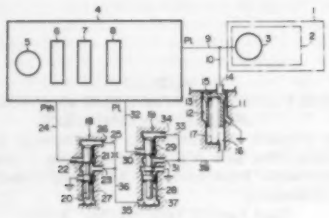
an engine-characteristic store storing an optimum fuel consumption curve which is a function of said engine connected in one of said lines for modifying a signal transmitted therethrough in accordance with said optimum consumption curve.

4,428,258

TRANSMISSION CONTROL SYSTEM WITH MODIFIED BACK PRESSURE ACCUMULATOR

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 25, 1980, Ser. No. 210,223
Claims priority, application Japan, Mar. 27, 1980, 55-39536
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.³ B60K *41/24*
U.S. Cl. 74—867 **1 Claim**



1. For an automatic transmission for an engine powered vehicle, comprising:

a gear transmission mechanism and a plurality of fluid pressure actuated friction engaging mechanisms, a plurality of speed stages being provided by said gear transmission mechanism according to selective actuation of said friction engaging mechanisms;

a fluid pressure control system comprising:

(a) a line fluid pressure control valve which produces a line fluid pressure which increases from a predetermined base pressure by an amount approximately proportional to the degree of a throttle opening representative of engine load;

(b) a throttle fluid pressure control valve which produces a throttle fluid pressure which is approximately proportional to the degree of said throttle opening;

(c) a shift valve which receives supply of said line fluid pressure and which selectively supplies it according to the operational conditions of the vehicle;

(d) a fluid pressure passage which receives said selective supply of fluid pressure from said shift valve and which conducts it to one of said friction engaging mechanisms;

(e) an accumulator comprising an accumulator chamber and a back pressure chamber, the accumulator chamber being connected so as to accumulate fluid from an intermediate point on said passage; and

(f) a means for controlling fluid pressure, comprising:

a first fluid pressure modulation valve which comprises a first bore;

a first valve element slidably mounted within said first bore;

a first input port opening in said first bore;

a first output port, opening in said first bore, communication of which with said first input port is established when said first valve element is positioned beyond a first point in a first direction within said first bore, and communication of which to said first input bore is interrupted when said first valve element is positioned beyond said first point in the direction opposite to said first direction within said first bore;

a first compression coil spring biasing said first valve element in said first direction; and

a first biasing chamber, supply of fluid pressure to which biases said first valve element in the direction opposite to said first direction; said throttle fluid pressure being supplied to said first input port, and a throttle modulator fluid pressure being taken out from said first output port and also being fed therefrom to said first biasing chamber; and

a second fluid pressure modulation valve which comprises:

a second bore;

a second valve element slidably mounted within said second bore;

a second input port opening in said second bore;

a second output port, opening in said second bore, communication of which with said second input port is established when said second valve element is positioned beyond a second point in a second direction within said second bore, and communication of which to said second input port is interrupted when said second valve element is positioned beyond said second point in the direction opposite to said second direction within said second bore;

a second compression coil spring biasing said second valve element in said second direction;

a second biasing chamber, supply of fluid pressure to which biases said second valve element in the direction opposite to said second direction; and

a third biasing chamber, supply of fluid pressure to which biases said second valve element in said second direction; said line fluid pressure being supplied to said second input port, said throttle modulator fluid pressure being supplied to said third biasing chamber, and an output fluid pressure of said fluid pressure control means being taken out from said second output port and also being fed therefrom to said second biasing chamber;

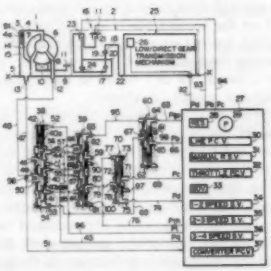
wherein structural parameters of said first and second fluid pressure modulation valves are so determined that, in a first range the degree of throttle opening between zero opening and a relatively small intermediate opening said output fluid pressure is lower than said line fluid pressure and increases more rapidly than said line fluid pressure as said throttle opening increases so as to become the same as said line fluid pressure when the throttle opening reaches the upper limit of said first range of throttle opening, in a second range the degree of throttle opening between a relatively large intermediate opening and full opening, said output fluid pressure is lower than said line fluid pressure and is substantially constant regardless of said throttle opening so as to be the same level as the line fluid pressure at the lower limit of said throttle opening in said second range, and in a third range the degree of throttle opening between said first range and said second range said output fluid pressure is the same as said fluid line pressure.

4,428,259

FAIL SAFE AUTOMATIC TRANSMISSION LOCK UP CLUTCH CONTROL SYSTEM

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 28, 1981, Ser. No. 287,864
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—867 **2 Claims**



1. In an automatic transmission for an engine driven vehicle comprising:

(a) a gear transmission mechanism comprising a plurality of hydraulic fluid pressure activated friction engaging mechanisms, including a first friction engaging mechanism which, when engaged, provides a highest speed stage, and a second friction engaging mechanism which, when engaged, provides a next to highest speed stage, provided that the other friction engaging mechanisms are engaged or disengaged according to a particular predetermined pattern of combination of engagement and disengagement; and

(b) a torque converter with a lock up clutch, comprising a first and second hydraulic fluid channel communicated with an interior of said torque converter, said lock up clutch being selectively engaged or disengaged according to whether hydraulic fluid pressure is supplied to said first hydraulic fluid channel and is released from said second hydraulic fluid channel or it is supplied to said second hydraulic fluid channel and is released from said first hydraulic fluid channel;

a transmission control system comprising:

(c) a source of hydraulic fluid pressure;

(d) a line hydraulic fluid pressure control valve which produces a line hydraulic fluid pressure from said source;

(e) a governor hydraulic fluid pressure control valve which produces a governor hydraulic fluid pressure from said line hydraulic fluid pressure, said governor hydraulic fluid pressure being representative of vehicle speed and increasing with increase of vehicle speed;

(f) a converter hydraulic fluid pressure control valve which produces a converter hydraulic fluid pressure from said source;

(g) a speed shift valve which switches over a supply of said line hydraulic fluid pressure alternatively to provide a brake hydraulic fluid pressure when said gear transmission is to provide said highest speed stage or to provide a clutch hydraulic fluid pressure when said gear transmission is to provide said next to highest speed stage;

(h) a lock up clutch control valve comprising a housing formed with a bore, a valve spool member and a piston member coaxially fitted within said bore so as to abut against one another by their ends, and a spring which biases said valve spool member towards said piston, a first chamber being defined at one end of said piston member towards said piston, a first chamber being defined at one end of said piston member remote from said valve spool member, to which said piston member exposes a first effective pressure receiving surface, a second chamber being defined around meeting ends of said valve spool member and said piston member, to which said valve spool member exposes a second effective pressure receiving surface; and

a third chamber being defined at another end of said valve spool member remote from said piston member, to which said valve spool member exposes a third effective pressure receiving surface, said third effective pressure receiving surface being so small as compared with first and second effective pressure receiving surfaces that said valve spool member is shifted toward said third chamber when either said first or second chamber is supplied with said line hydraulic fluid pressure while said third chamber is supplied with said line hydraulic fluid pressure, said lock up clutch control valve being switched over so as to supply said converter hydraulic fluid pressure to said first hydraulic fluid channel while releasing said second hydraulic fluid channel when said valve spool member is shifted toward said third chamber, and to supply said converter hydraulic fluid pressure to said second hydraulic fluid channel while releasing said first hydraulic fluid channel when said valve spool member is shifted toward said second chamber; and

(i) a lock up clutch control hydraulic fluid circuit, including a least one switch-over valve which is actuated by said governor hydraulic fluid pressure and conducts said brake hydraulic fluid pressure and said clutch hydraulic fluid pressure separately to one and the other of said first and second chambers of said lock up clutch control valve when said governor hydraulic fluid pressure is higher than a predetermined value, while constantly supplying said line hydraulic fluid pressure to said third chamber of said lock up clutch control valve.

4,428,260

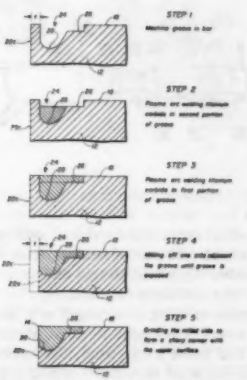
METHOD OF FORMING A CUTTING EDGE

Richard R. Eby, Ephrata, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 1, 1982, Ser. No. 353,464

Int. Cl.³ B21K *19/00, 11/00*

U.S. Cl. 76—104 R **5 Claims**



1. A method of forming a long wearing shear edge on a shearbar comprising the steps of:

machining a groove in a shearbar of a first material having a hardness h_1, said bar having an elongated axis and having a substantially rectangular cross section including an upper and lower surface and a pair of side surfaces, said groove being formed in the direction of said axis in said upper surface adjacent to and spaced from one of said side surfaces at a thickness t, said groove having a common arcuate surface with said bar;

using a plasma arc welding process, filling said groove with a second material having a hardness h_2, where $h_2 > h_1$;

milling off said one side surface adjacent said groove until said thickness t diminishes and exposes said groove; and

grinding said milled side for forming a sharp corner with said upper surface.

4,428,261

SCREW FEED APPARATUS FOR USE WITH A POWER SCREWDRIVING TOOL

Yukihiro Takatsu; Shoichi Yamamoto, and Masaru Kamioka, all of Shiga, Japan, assignors to Nisco Inc., Shiga, Japan

Filed Feb. 23, 1982, Ser. No. 351,463

Claims priority, application Japan, Feb. 23, 1981, 56-24867[U]; Sep. 14, 1981, 56-136971[U]

Int. Cl.³ B25B *23/02*

U.S. Cl. 81—434 **5 Claims**

1. A screw feed apparatus for use with a power screwdriving tool, comprising

an internally threaded adapter detachable by threads to an externally threaded shank portion of said tool,

an elongated driver member detachable at one end to a chuck formed with said shank portion,

a casing relatively slidably mounted on said adapter,

at least one spring disposed within said casing, for urging said adapter axially outwardly,

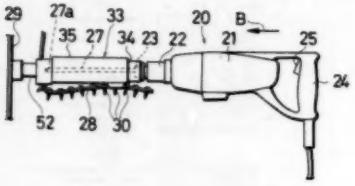
a pair of brackets mounted to a forward end of said casing

and provided with guide means for guiding a flexible magazine belt in a direction transverse to a longitudinal axis of said tool,

said magazine belt carrying a series of self-drilling screws which are aligned in line and spaced at a regular pitch,

a pair of feed sprocket wheels disposed within said brackets, for feeding said magazine belt intermittently by said regular pitch,

a nose piece mounted to a forward end of at least one of said brackets, for providing a predetermined distance of screw receiving space between said forward end of the brackets and a workpiece into which the self-drilling screws are driven,



a ratchet wheel supported by one of said brackets so as to co-rotate with said pair of feed sprocket wheels,

a slide member supported on said casing so as to be axially slidable back and forth rectilinearly,

said slide member being so arranged as to move toward said ratchet wheel in response to forward movement of said adapter and move away from said ratchet wheel in response to rearward movement of said adapter, and

a claw means operatively supported by said slide member so as to force the ratchet wheel to rotate intermittently by said regular pitch as said slide member moves away from said ratchet wheel.

4,428,262

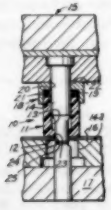
ADJUSTABLE LONG LIFE STRIPPER

Charles D. Vlahek, 4807 W. Main St., Belleville, Ill. 62223

Filed Jul. 9, 1982, Ser. No. 396,803

Int. Cl.³ B26D 7/06

U.S. Cl. 83—139 **1 Claim**



1. An adjustable long life stripper, comprising, in combination, a hollow, cylindrical main body having an end wall on one end thereof and an opening on an opposite and thereof, and a cup-shaped adjustably mounted on said opposite end, a central opening through said cap for receiving a punch therethrough, a pair of bayonet slots on opposite sides of said cap, a pair of outwardly protruding pins on opposite sides of said main body for engagement in said bayonet slots, and each said bayonet slot comprising an axially extending portion and a circumferentially extending portion which is angularly inclined, said angularly inclined portion including a row of notches along its length for seating said pins selectively.

4,428,263

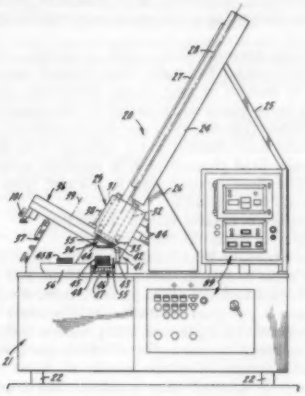
FOOD LOAF SLICING MACHINE

Scott A. Lindee, New Lenox, and Glenn A. Sandberg, Lockport, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Oct. 8, 1981, Ser. No. 309,699

Int. Cl.³ B26D 1/18, 3/22

U.S. Cl. 83—354 **21 Claims**



1. In a high volume food loaf slicing machine of the kind comprising:

a loaf support, supporting a food loaf for movement along a downwardly inclined path;

loaf feed conveyor means, positioned at the lower end of the food loaf path, for continuously advancing a food loaf along that path and into a slicing station;

and a rotory knife, supported for orbital movement into and out of the slicing station in a direction transverse to the food loaf path, for cyclically cutting individual slices from the loaf as the loaf enters the slicing station;

the improvement comprising:

variable speed main drive motor means;

knife orbit drive connection means, connecting the main drive motor means to the knife to drive the knife through its orbital movement at a slicing rate determined by the speed of the main drive motor means;

conveyor drive connection means, connecting the main drive motor means to the loaf feed conveyor means to drive the conveyor means at a loaf feed rate determined in part by the speed of the main drive motor means;

variable speed knife rotation motor means, connected to the knife to drive the knife through its rotary motion at a cutting rate determined by the speed of the knife rotation motor means and independent of the speed of the main drive motor means;

a collar encompassing the loaf at the entrance to the slicing station, the collar being of transverse split construction, including first and second collar members, one collar member being movable toward and away from the other in a direction transverse to the food loaf path;

collar closure means, connected to the one collar member, for biasing the movable collar member toward the other collar member to maintain both collar members in predetermined limited pressure engagement with the lowermost end of the feed loaf but permitting continuous movement of the loaf through the collar;

a loaf size sensor, connected to the one collar member, for sensing movements of the one collar member indicative of variations in cross-sectional area of the loaf;

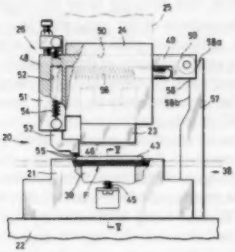
and control means, connected to the loaf size sensor, for actuating the conveyor drive connection means to vary the loaf feed conveyor speed to compensate for changes in loaf cross-sectional area.

4,428,264

APPARATUS FOR FORMING AN ELEMENT-FREE GAP IN A CONTINUOUS SLIDE FASTENER CHAIN

Hideo Shimai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 8, 1982, Ser. No. 346,845
Claims priority, application Japan, Feb. 12, 1981, 56-19977
Int. Cl.³ B26D 1/25, 7/02
U.S. Cl. 83—465 10 Claims



1. An apparatus for forming a space section devoid of coupling elements in a continuous slide fastener chain having a pair of rows of interengaged coupling elements, the apparatus comprising:

(a) a stationary die having an elongated vertical slot opening to the top surface of said die for underlying the interengaged coupling elements;

(b) a reciprocable punch blade movable toward and away from said die and having cutting edges along opposite sides, said cutting edges being projectable into said elongated slot for cutting the interengaged coupling element along a length corresponding to the length of the space section to be formed, and

(c) means responsive to the position of said punch blade for locating the slide fastener chain in the desired position relative to said punch blade,

(d) said punch blade being relieved at opposite ends along said cutting edges so as to form a pair of wing portions disposed one on each side of said punch blade, said elongated slot in said die having at its opposite ends a pair of lateral branches disposed one on each side of said elongated slot in opposite relation to said sides of said punch blade on which said wing portions are disposed, respectively.

4,428,265

TAPE SLITTER AXIAL LOADING SYSTEM

James C. Bolton, Ojai, Calif., assignor to Industrial Tools Inc., Ojai, Calif.

Filed Oct. 22, 1981, Ser. No. 313,760
Int. Cl.³ B23D 19/04; B26D 1/24
U.S. Cl. 83—502 5 Claims

4. A tape slitter including, in combination:

(a) a frame;

(b) a first arbor;

(c) bearing means supporting said first arbor at each end in said frame for rotational movement relative to sad frame, said bearing means and first arbor being axially movable in said frame;

(d) a plurality of male blades in the form of discs carried on said first arbor in axially spaced positions;

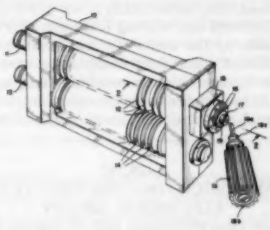
(e) a second arbor;

(f) bearing means holding said second arbor at each end in said frame against axial movement while providing proper bearing for rotation;

(g) a plurality of female blades carried by said second arbor and having portions facing in a first axial direction towards one end of said first arbor for engaging said male blades respectively, so that movement of said first arbor in a second axial direction opposite to said first axial direction increases the engagement force between the male and female blades;

(h) a stationary, cup-shaped member secured to said frame adjacent to said one end of said first arbor, the floor of said cup-shaped member having a threaded opening coaxial with said first arbor;

(i) a movable member threadedly received in said opening;



(j) resilient means received in said cup-shaped member positioned between said movable member and said bearing means supporting said first arbor at said one end; and

(k) a manually adjustable torque applying means to rotate said movable member until a given torque is exerted on said torque applying means corresponding to a given axial force, after which said movable member can no longer be rotated by said torque applying means

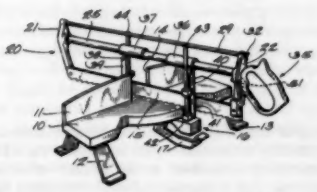
whereby a desired given force of said male blades against said female blades can be automatically set by said torque applying means without the need of special force indicating gauges.

4,428,266

MITER SAW HAVING A SWIVEL HANDLE

Burton G. Keddie, Elm Grove, Wis., assignor to Hempe Manufacturing Co., New Berlin, Wis.

Filed Jan. 18, 1982, Ser. No. 340,159
Int. Cl.³ B27B 21/00; B27G 5/02
U.S. Cl. 83—767 9 Claims



8. Mitering apparatus comprising:

a table for supporting the material to be cut,

an arm mounted under the table for swinging in a horizontal plane about a vertical axis,

a pair of spaced apart post members projecting vertically upwardly from the arm,

guide means slidable on the respective post members, said guide means each having means defining a slot through which a saw blade travels for cutting material on the table,

a linear bearing element pivotally attached to each guide means at an end thereof remote from the slots, each bearing element having a bore whose axis is generally horizontally directed and are aligned with each other,

a frame structure comprising an elongated cylindrical member slidable axially through the aligned bores of said linear bearing elements, for performing a sawing operation, and

upright link members, respectively, connected intermediate their ends to opposite ends of said cylindrical member,

a saw blade spanning between one pair of corresponding ends of said link members and passing through said slots,

means for urging the other corresponding ends of said links members towards each other to thereby spread said one pair of ends for holding said blade in tension,

a longitudinally extending shaft fixed in a selected one of said handle or a link member and journaled for rotation in the other of said handle or link member for permitting said handle to swivel continuously about the longitudinal axis of said shaft lying substantially in the plane of the blade to thereby prevent any twisting force that may be applied to said handle by the user's arm and hand following their natural line of action from being transmitted to the blade while at the same time compelling force applied transversely to said shaft axis to induce cutting to be transmitted through said shaft only in the plane of the blade.

4,428,267

DIGITAL SEMICONDUCTOR CIRCUIT FOR AN ELECTRONIC ORGAN

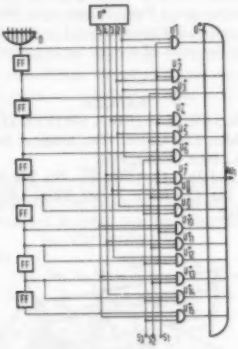
Helmut Rösler; Otto Mühlbauer, both of Munich; Josef Dempf, Kloster-Lechfeld, and Klaus-Dieter Bigall, Vaterstetten, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,892

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024931

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **6 Claims**



1. In a digital semiconductor circuit for an electronic organ having a plurality of control inputs addressed via a keyboard and corresponding in number to the number of keys of the organ keyboard, and a plurality of audiofrequency signal inputs addressed with periodic electrical oscillations by an oscillator system, each control input being associated with a respective key of the keyboard and each audiofrequency signal input being permanently assigned with a respective tone frequency of the highest octave of the organ; the control signals serving to address the control inputs by the keys of the keyboard corresponding to the logical levels "1" and "0"; the individual control inputs being associated with a respective cell of a clock-controlled shift register which is operated as a parallel-to-series converter, and the signal output of the shift register as well as clock pulses applied for the operation thereof being provided for controlling a switching system having as inputs a totality of the audiofrequency signal inputs and also having a totality of audiofrequency signal outputs, the audiofrequency signal outputs respectively controlling an amplitude controller and being less in number than the number of the control inputs; two memories, respectively, being associated with each of the audiofrequency signal outputs of the switching system and each of the memories being followed by a respective decoder; a tone address counter provided with counting pulses from the shift pulses of the shift register for addressing the respective pair of memories associated with the individual audiofrequency signal outputs in such a manner that a first one of the memories and a following first decoder are associated with evaluation of the tone name, and a second one of the memories, as well as a following second decoder, is associated with evaluation of the octave of the tone information associated with the respective audiofrequency signal based upon the action of the switching system, and deriving from the keyboard of the organ; each of the outputs of the respective first decoder associated with the individual audiofrequency signals being tied together with a respective one of the provided audiofrequency signal inputs and each of these audiofrequency signal inputs with one of the provided outputs of the first decoder via a respective AND gate belonging to a first group of AND gates, and the outputs of the first group of AND gates being tied together via a common first OR gate, and a frequency divider and a second group of AND gates being controlled by the first OR gate, the second input of the individual AND gates of said second group thereof being addressed by the individual outputs of the second decoder, the improvement therein comprising a number t of divider stages in the frequency divider at least equal to a number q of the octaves provided in the keyboard of the organ, and a number u of the AND gates provided in the second group of AND gates being greater than the number q of the octaves provided in the keyboard of the organ; all of the AND gates of the second group having a third signal input; and, at least one setting input connectible by an individual playing the organ via a switch to the logical level "1," for addressing said third signal inputs of these AND gates.

4,428,268

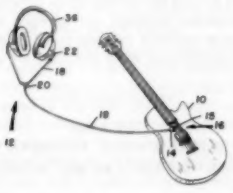
SELF-CONTAINED GUITAR AMPLIFICATION SYSTEM

Joseph E. Ingoglia, 5564 Whitby Rd., Baltimore, Md. 21206

Continuation of Ser. No. 69,248, Aug. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 952,922, Oct. 19, 1978, abandoned. This application Mar. 16, 1982, Ser. No. 358,742

Int. Cl.³ G10D *1/08*; G10G *7/00*; G10H *3/18*

U.S. Cl. 84—1.16 **10 Claims**



1. In an electrical guitar, said electrical guitar having a body means and strings as parts thereof, said body means having a top portion thereof, said top portion being located immediately under said strings, a self-contained guitar amplification system, comprising:

a first sound pick-up means, said first sound pick-up means being suitably and securely affixed to the exterior surface of said top portion of said body means of said electrical guitar, said first sound pick-up means being disc-like in configuration and magnetic, said magnetic disc-like first sound pick-up means having a magnetic quality, said first sound pick-up means being capable of picking up sound vibrations from said exterior surface of said body means when said guitar is played;

a second sound pick-up means, said second sound pick-up means having a first side and a second side, said first side being placed upon said first sound pick-up means, said

second sound pick-up means being disc-like in configuration and magnetic, said magnetic disc-like second sound pick-up means having a magnetic quality, said magnetic quality of said first and second sound pick-up means causing said disc-like first and second pick-up means to be magnetically attracted to each other and to be magnetically affixed securely to each other, said second sound pick-up means being capable of picking up receiving, and transmitting said sound vibrations received from said first sound pick-up means by contact therewith, said second sound pick-up means having a tube-like means projecting from said second side thereof;

a transmission tube means, said transmission tube means being removably affixed to said tube-like means on said second sound pick-up means, said transmission tube means receiving and transmitting therethrough said sound vibrations received from said second sound pick-up means;

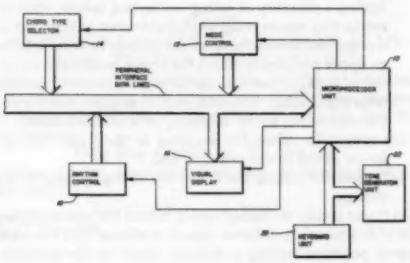
a pair of listening means, said listening means being removably affixed to said transmission tube means, said listening means being of a configuration to cover the ears of a quitarist, said listening means receiving said sound vibrations from said transmission tube means and transmitting said sound vibrations to the ears of said guitarist.

4,428,269

CHORD TEACHING SYSTEM AND METHOD FOR AN ELECTRONIC MUSICAL INSTRUMENT

Angelo A. Bione, Elmhurst, and Donald R. Sauvey, Palatine, both of Ill., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Jan. 18, 1982, Ser. No. 340,584
Int. Cl.³ G10G *1/02, 3/04;* G10H *1/38, 1/40*
U.S. Cl. 84—1.01 **51 Claims**



1. A chord teaching system for use in an electronic musical instrument having a keyboard providing a keyboard output signal on at least one of a plurality of keyboard output lines and a tone generator receiving said keyboard output signal on at least one of said plurality of keyboard output lines and producing a musical output and for enabling a instrument player to choose a chord to be learned, indicating the key corresponding to at least the root note of the chosen chord and sounding the chosen chord, said chord teaching system being capable of operating in at least two different teaching modes and comprising:

a microprocessor unit programmed for operating in at least two different modes corresponding to the two different teaching modes of said system and having a plurality of input lines, a plurality of output lines and a memory containing information signals representing musical chord type patterns normalized to an alphabetic note;

mode means actuatable by an instrument player to select the mode of operation of said microprocessor and having a mode output signal line connected to at least one of said plurality of input lines of said microprocessor, said mode means producing a mode output signal on said mode output line to control the mode of operation of said microprocessor;

chord type means actuatable by an instrument player to select the type of said chord chosen and having a chord type output line connected to at least one of said plurality of input lines of said microprocessor, said chord type means producing a chord type signal on said chord type output line;

select key means actuatable by an instrument player and forming a portion of said keyboard and having key output lines connected to at least one of said plurality of input lines of said microprocessor, said select key means producing a key output signal representing the alphabetic note of said chosen chord;

said microprocessor unit responsive to said chord type signal for selecting information signals representing one of said normalized chord type patterns stored in said memory and responsive to said key output signal for shifting said information signals representing said normalized chord type patterns into the key of said chosen chord and placing said shifted normalized chord type pattern information signals on at least one of said output lines of said microprocessor; and,

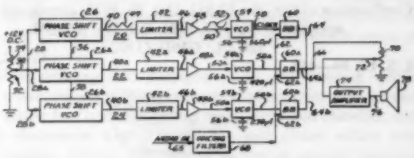
a visual display means having a plurality of input lines connected to at least one of said plurality of output lines of said microprocessor and responsive to said shifted normalized chord type pattern information signals for indicating to the instrument player at least one of said select keys corresponding to the root note of said chosen chord.

4,428,270

ELECTRONIC VIBRATO OR CELESTE

Anthony C. Ippolito, De Kalb, Ill., assignor to The Wurlitzer Company, De Kalb, Ill.

Filed Nov. 16, 1981, Ser. No. 321,733
Int. Cl.³ G10H *1/043*
U.S. Cl. 84—1.24 **23 Claims**



18. Electronic circuit means for creating a vibrato or celeste effect in an electronic musical instrument having electric oscillations corresponding to musical tones comprising means for producing a plurality of flat topped triangular waves having reverse slopes of equal duration, the flat top of each wave being of substantial duration relative to a half cycle of that wave, a like plurality of electronic delay means capable of modulation and to which said electric oscillations are fed, and means connecting said wave producing means to said delay means to modulate the delay.

4,428,271

METHOD AND MEANS FOR ATTACHING REED TO WIND INSTRUMENTS

Thomas W. Winslow, and John G. Winslow, III, both of 1106 Shasta Dr., Madison, Wis. 53704

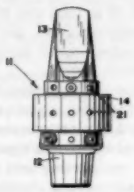
Continuation-in-part of Ser. No. 212,073, Dec. 1, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 287,231
Int. Cl.³ G10D *9/02*
U.S. Cl. 84—383 R **11 Claims**

1. A ligature for a single reed musical wind instrument comprising in combination

a band for encircling the mouthpiece body of a wind instrument wherein said band is provided with means for tightening and loosening clamping pressure exerted thereby,

a plurality of orifices oriented substantially perpendicular axially to surface tangency with said band,

at least one post detachably interchangable and selectively disposed among said orifices extending through one said orifice for contacting and securing a reed on a wind instrument mouthpiece body wherein said post embodies an extremity configured as a contact point and comprises a mate-



rial of selectively chosen resiliently yieldable properties configured and disposed for resiliently transmitting clamping force exerted by said band solely to said contact point independent of any other post, thereby to resiliently secure a reed on a mouthpiece body.

4,428,272

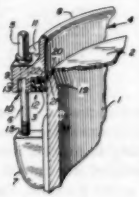
DRUM HOOP

Robert Andre, Des Plaines, and Alfred J. LeMert, Mount Prospect, both of Ill., assignors to Ludwig Industries, Inc., Chicago, Ill.

Continuation of Ser. No. 89,512, Oct. 30, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,003

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—413 **8 Claims**



1. A counter hoop for a musical drum, said drum comprising a flexible and tensionable drum head including a peripheral edge,

a locking ring secured to the peripheral edge of the drum head,

a shell having at least one surface with which said drum head contacts and against which it is held tightly when the drum is assembled,

adjustable head tensioning means for varying the tension of the drum head by drawing it over said shell contact surface, said hoop comprising

a main body portion, including an inner channel, and

an outer channel formed by a pair of extensions extending from the main body portion,

said outer channel comprising a smooth outer surface substantially free of protuberances extending therefrom,

one of said extensions together with a surface of said counter hoop and the drum shell being in substantial flat surface contact with three sides of said head channel to prevent rotation of the same when tension is applied to said tensioning means.

4,428,273

AUTOMATIC CHORDER FOR STRINGED INSTRUMENTS

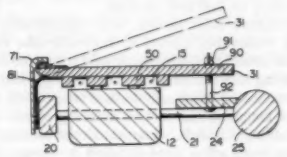
Emile H. Fevron, 116 Mountain St., Sudbury, Ontario, Canada P3B 2R2

Filed Jan. 19, 1982, Ser. No. 340,871

Claims priority, application Canada, Jan. 27, 1981, 369433

Int. Cl.³ G10D *3/08*

U.S. Cl. 84—317 **26 Claims**



1. Apparatus to facilitate playing of a stringed musical instrument such as a guitar, banjo, or the like including a head, a neck having frets spaced longitudinally therealong and a plurality of strings spaced laterally thereacross, adjacent strings being spaced an equal distance from each other and being tuned to have a difference in pitch of four half-tones, said apparatus comprising:

(a) frame means mountable on said neck;

(b) a plurality of levers pivotally mounted to said frame means and, when mounted on the neck of said stringed musical instrument, extending transversely over the neck and strings of the musical instrument; each of said levers having a plurality of string contacting means, each string contacting means being engageable with at least one of the strings; said levers being independently moveable between an upper position in which the string contacting means are out of engagement with the strings and a lower position in which the string contacting means engage selected strings corresponding to the fingering of a selected chord;

(c) means for releasably securing to the frame one of the levers in the lower position; and

(d) means for biasing the levers out of engagement with said strings;

said frame means including sliding means for lateral shifting of the levers between different lateral positions, two consecutive lateral positions having a distance equal to the distance between two adjacent strings.

4,428,274

VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Jun. 22, 1981, Ser. No. 275,772

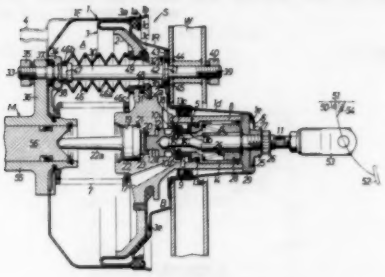
Claims priority, application Japan, Sep. 10, 1980, 55-125743

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 A **7 Claims**

1. A vacuum booster device comprising a booster shell, a booster piston axially slidably positioned in said booster shell, a piston diaphragm having inner and outer peripheral edges secured to the rear surface of said booster piston and the inner peripheral surface of said booster shell, a front side first working chamber and a rear side second working chamber defined in said booster shell by said booster piston and said piston diaphragm, said first working chamber communicating with a vacuum supply source, said second working chamber selectively communicating with said first working chamber or the external atmosphere through a control valve, an input rod located opposite to said booster piston for movement toward and away from said booster piston, said input rod being connected to said control valve to produce a pressure difference between said working chambers for causing said booster piston

to follow the forward movement of said input rod, tie rods extending through said booster piston and said piston diaphragm for connecting the front and rear walls of said booster shell, said piston diaphragm having a plurality of through holes for passage of said tie rods, sealing means positioned between said tie rods and booster piston for permitting the free movement of said booster piston, said sealing means including a first



annular bead integrally formed around the inner peripheral edge of said piston diaphragm, a plurality of second annular beads integrally formed around the peripheral edges of each of said through holes, and a plurality of paired straight beads formed on one side of said piston diaphragm and extending between said first bead and said second beads along common tangential lines with respect to said first bead and said second beads.

4,428,275

DEVICE FOR CONNECTING A PLUNGER AT ITS CRANK END TO A CONNECTING ROD

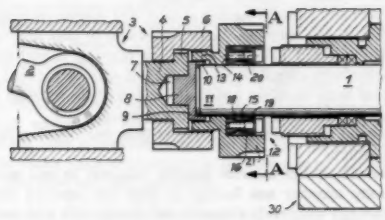
Adalbert Huperz, Hockenheim, and Wolfgang Maasberg, Hünxe-Krudenburg, both of Fed. Rep. of Germany, assignors to Woma-Apparatebau W. Maasberg & Co. GmbH, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,218

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017773

Int. Cl.³ F16J 1/14; F16C 9/00

U.S. Cl. 92—188 **4 Claims**



1. In a device for connecting a plunger having high surface hardness and made of ceramic material, to a connecting rod, the crosshead having a coupling element with a flange, and a coupling nut mounted to the flange, the improvement wherein the coupling element (4) includes a centering bore (7) and a shoulder engaged with the coupling nut (6), and further comprising a thrust plate (9) mounted to the coupling element, said thrust plate having a first side with a centering stud (8) extended into said centering bore and an annular shoulder surrounding said centering stud seated against the flange (5), said thrust plate having a centering recess (10) on a second side opposite said first side for receivingly centering an end (11) of the plunger (1), a collar (13) threadably engaged to the coupling nut (6) and having a cylindrical recess therein through which the plunger extends, said collar engaged over said thrust plate at an end of said thrust plate on said second side thereof and clamping means connected to the plunger and disposed in said cylindrical recess for clamping the plunger to said collar.

4,428,276

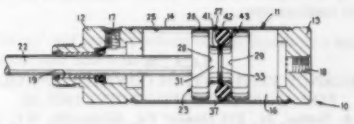
O-RING SEAL FOR PISTON OF DOUBLE-ACTING FLUID PRESSURE CYLINDER

Stanley M. Loveless, Oshtemo Township, Kalamazoo County, Mich., assignor to Humphrey Products Company, Kalamazoo, Mich.

Filed Oct. 19, 1981, Ser. No. 313,039

Int. Cl.³ F16J 9/00

U.S. Cl. 92—249 **9 Claims**



1. A double-acting pneumatic cylinder, comprising:

a housing having a substantially cylindrical chamber therein;

a piston of circular cross section supported coaxially in said housing chamber for movement axially thereof, said piston having an annular circumferential groove in a radially outer surface thereof, said groove being defined between a pair of opposed, spaced, substantially axially facing annular surfaces;

said piston also having an annular rib extending radially outwardly from the bottom of said groove in axially spaced relationship between said annular surfaces, the radially outward extension of said rib from the bottom of said groove being a small fraction of the radial depth of the groove;

means defining two passageways in said housing which communicate with said chamber on opposite sides of said piston for conducting pressurized air to said chamber; and

an elastomeric O-ring encircling said piston within said annular groove, said O-ring having an outside diameter slightly greater than the inside diameter of said housing chamber and a first annular band of engagement with said housing chamber, said O-ring having an inside diameter slightly less than the outside diameter of said annular rib and a second annular band of engagement with said rib, the axial width of said annular rib being substantially less than the cross-sectional diameter of said O-ring, and said O-ring being transversely movable within said groove in respose to low air pressure selectively supplied to said chamber through said passageways by rocking on said rib and simultaneously sliding along the wall of said housing chamber between a first position having a third annular band of engagement with one said annular surface of said piston and a second position having said third annular band of engagement with the other said annular surface of said piston.

4,428,277

OSCILLATING REED AND METHOD

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

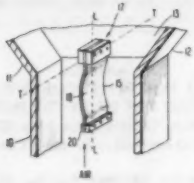
Division of Ser. No. 119,699, Feb. 8, 1980, Pat. No. 4,336,909. This application Sep. 14, 1981, Ser. No. 302,285

Int. Cl.³ B60H 1/24

U.S. Cl. 98—2 **2 Claims**

2. A method of silencing the oscillations of an air operated resilient reed spring having the downstream end thereof teth-

ered and the upstream end free to oscillate back and forth in a stream of air, which comprises,



forming a series of transverse corrugations spaced along the body of said reed to prevent twist bending of the body of said resilient reed.

4,428,278

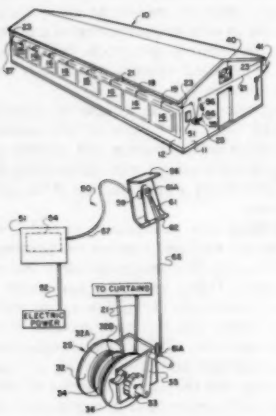
EMERGENCY VENTILATION CONTROL APPARATUS FOR ANIMAL CONFINEMENT HOUSE

James A. Sutton, Jr., 816 Henkel Rd., Statesville, N.C. 28677

Filed Aug. 26, 1981, Ser. No. 296,570

Int. Cl.[3] F24F *13/08*

U.S. Cl. 98—33 R 3 Claims



2. An emergency ventilation apparatus responsive to electric power failure for opening covers normally covering ventilation openings in a confinement house of the type used for raising poultry and livestock, said covers adapted for being adjustably positioned between a raised position covering said ventilation openings and a lowered position with said ventilation openings uncovered, said confinement house having electric power supply means and power ventilation means operably connected to said electric supply means, said apparatus comprising:

(a) a magnet energized by said electric power supply means and de-energized upon failure of said electric power supply means;

(b) a winch, winch crank and cable operably connected to said covers and adapted for raising said covers from a lowered position to a raised position;

(c) a strand releasably interconnecting said magnet and said winch crank;

(d) an elongate member pivotally mounted intermediate said winch crank and said magnet in an overcenter position impinging upon said strand thereby providing a mechanical advantage to said magnet, said elongate member having a portion thereof comprised of a magnetically attractable material for being magnetically engaged to said magnet and including means for releasably carrying the end of said strand remote from the end carried by said winch crank and being positioned intermediate said winch crank and said magnet in such position that upon de-energization of said magnet, said elongate member pivots, thereby releasing said strand and permitting said winch to lower said covers.

4,428,279

VENTILATION REGISTER

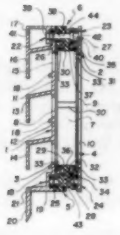
Julius Maus, Stuttgart, Fed. Rep. of Germany, assignor to Gretsch-Unitas GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,908

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034765

Int. Cl.[3] E06B *7/082*

U.S. Cl. 98—98 20 Claims



1. A ventilation register comprising:

a first body member having at least one opening therein;

a first shutter member slidably mounted to said first body member and having at least one opening therethrough selectively alignable and disalignable with said at least one first body member opening for selectively opening and closing said first body member opening;

a second body member having at least one opening therethrough;

a second shutter member slidably mounted to said second body member and having at least one opening therethrough selectively alignable and disalignable with said at least one second body member opening for selectively opening and closing said second body member opening;

drive means connected to said first and second shutter members for displacing said first and second shutter members substantially simultaneously in the same direction;

at least two insulation connector members connected between said first and second body members adjacent opposite longitudinal edges of said first and second body members for holding said first and second body members together and defining a space therebetween;

each of said insulation connector members having a portion made of insulating material bearing against a respective shutter for holding each respective shutter against its respective body member to which it is movably mounted.

4,428,280

COOKING APPARATUS

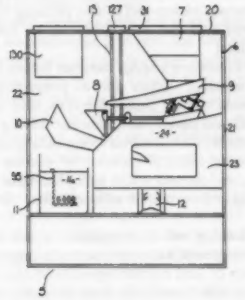
Ronald H. Williams, 52A Greenland Rd.; Mason T. Elliott, 3/77 Sylvia Rd., both of Auckland, New Zealand, and Leonard S. Moss, Brisbane, Australia, assignors to Ronald Harry Williams; Mason Thomas Elliott, both of Auckland, New Zealand and Alexander Peter Mirmikidis, Perth, Australia

Filed Nov. 20, 1981, Ser. No. 323,562

Claims priority, application New Zealand, Nov. 21, 1980, 195614; Dec. 22, 1980, 195909

Int. Cl.³ A47J 37/12

U.S. Cl. 99—356 12 Claims



1. Apparatus for cooking foodstuffs comprising:

a gravity hopper for storing and discharging raw or precooked foodstuffs;

metering means positioned lower than said hopper for metering a predetermined quantity of the foodstuffs received from the hopper;

conveyor means operatively connected between said hopper and said metering means comprising a generally downwardly sloping walled ramp, for conveying said foodstuffs under force of gravity from said hopper to said metering means;

vibrator means operatively associated with said conveyor means, for assisting the downward movement of the foodstuffs;

a vat for holding a cooking medium, positioned lower than said metering means; and

a cooking container displaceably positioned between said metering means and said vat, which is continuously cyclically displaceable between a first position in which said container receives foodstuffs from said metering means, a second position in which the foodstuffs move under force of gravity to a cooking part of said container and said cooking part is placed within said vat, and a third position in which the cooking part is removed from the vat and the foodstuffs move under force of gravity to a delivery part of said cooking container and are discharged.

4,428,281

COOKING GRILL

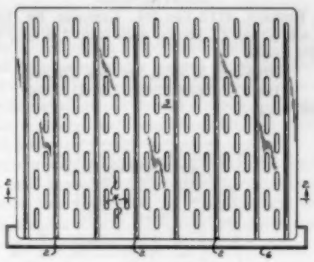
R. J. Miller, 1101 W. Breen Ave., Kingsford, Mich. 49801

Filed May 10, 1982, Ser. No. 376,643

Int. Cl.³ A47J 37/00

U.S. Cl. 99—445 7 Claims

1. A cooking grill comprising a flat level cooking surface having a multiplicity of uniformly distributed openings therethrough and a multiplicity of grooves inlaid therein, said openings and grooves being juxtaposed so as to effect the flowing of a major portion of liquids eminating from food being cooked on said cooking surface into said grooves and a minor portion of said liquids into said openings through which said minor portion falls into a heat source underneath said grill, said grooves being of a downward slope and direction to effect the



disposition of said major portions of said liquids to a location distant from said heat source.

4,428,282

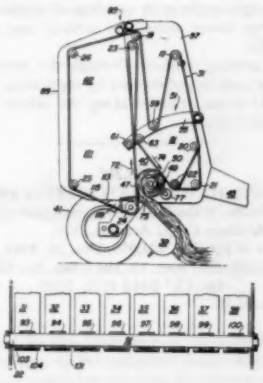
CYLINDRICAL BALER WITH SELF-CLEANING DRIVE ROLLER

Henry D. Anstey, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 28, 1982, Ser. No. 382,882

Int. Cl.³ B30B 5/06

U.S. Cl. 100—88 6 Claims



1. In a baler for forming a cylindrical bale off the ground comprising:

a pair of spaced sidewalls;

a guide roller extending between said sidewalls; and

a plurality of longitudinally extending, side-by-side belts transversely spaced between said sidewalls, defining a bale-forming chamber, and including a span looped below said roller, said span normally engaging the periphery of the bale during formation and drivable in a direction to move said span from the bale to said roller; the improvement wherein said roller comprises:

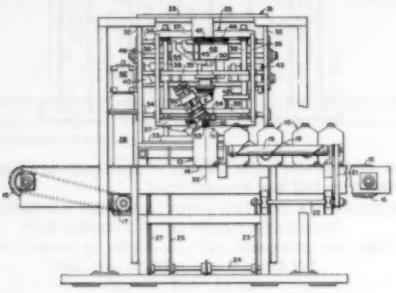
means for supporting the longitudinal edges of each of said plurality of belts out of contact with said roller to form a gap between the edges and the roller.

4,428,283

METHOD AND APPARATUS FOR SILK SCREEN PRINTING ON CONICAL OR CYLINDRICAL CONTAINERS

Rome R. Rudolph, 4113 Lee Rd., Gibsonia, Pa. 15044; Carl Strutz, and Frank C. Strutz, both R.D. 2, Camp Trees Rd., Mars, Pa. 16046

Filed Jun. 5, 1981, Ser. No. 270,869
Int. Cl.³ B41F *17/22, 17/28, 17/00*
U.S. Cl. 101—35 **22 Claims**



1. In a method of decorating a surface of a workpiece, the steps comprising:

supporting the workpiece against rotation about a support axis spaced from said surface,

moving a frame in an orbital path about said surface,

positioning a squeegee at one side of a decorating screen to establish line contact between the opposite side of the screen and said surface,

swinging the decorating screen from said frame while moving in said orbital path about a pivot axis forming substantially a right angle with said line of contact to roll the decorating screen along said surface, and concurrently therewith,

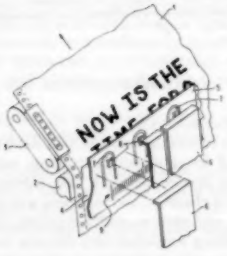
forcing a printing medium through the screen onto said surface at said line of contact by supporting the squeegee from said frame to move along the orbital path thereof about said surface.

4,428,284

BAND AND HAMMER DOT MATRIX PRINTER

William D. Thorne, Wake Forest, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 334,950, Dec. 28, 1981, abandoned. This application Aug. 11, 1983, Ser. No. 522,246
Int. Cl.³ B41J *3/12, 1/20*
U.S. Cl. 101—93.04 **2 Claims**



1. A dot matrix printing apparatus for printing dots on a recording paper along a desired printing line, comprising:

a platen and a recording paper, said platen supporting one surface of said paper at least along said desired printing line;

a dot font element carrier adjacent to the side of said paper opposite to said platen and generally parallel thereto, said carrier extending parallel to said printing line;

a plurality of dot font elements connected to said carrier on a surface thereof facing said paper, all of said dot font elements being colinearly spaced apart from each other by at least a first width measured along parallel to said printing line and formed into a single line extending along said printing line;

a driving means engaging said font element carrier for moving said carrier at a predetermined velocity in a direction parallel to said platen and to said printing line to cause said carrier and said dot font elements to travel along said printing line;

at least one stationary impact hammer means adjacent to said dot font element carrier and so positioned that said dot font element carrier passes between said impact hammer means and said platen, said hammer having an impact face of a second width measured along said printing line which is at least an integral number of widths of dot printer elements, said second width being less than said first width of spacing between said adjacent font elements on said carrier;

hammer actuating means connected to said hammer means for actuating said hammer means to impact a portion of the surface of said carrier opposite to the surface of said carrier on which said dot font elements are connected, said impact driving at least a portion of said carrier and said dot font elements thereon toward said recording paper;

timing means connected to said hammer actuating means for timing said actuation to impact said carrier when said font elements thereon are adjacent to portions of said printing line where printed dots are desired; and

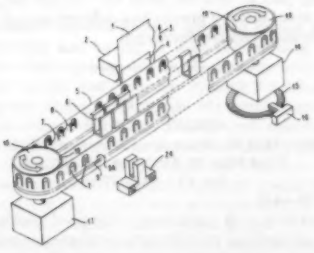
means for shifting said paper in a direction orthogonal to said printing line and in the plane of said printing line to position a new portion of said paper on said platen along said printing line so that selected dots are printed in successive lines on said paper with a selectable spacing between successive lines in order to form a required dot matrix.

4,428,285

OSCILLATORY BAND AND HAMMER DOT MATRIX PRINTER

Norman F. Cole, Raleigh, and William D. Thorne, Wake Forest, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 167,181, Jul. 9, 1980, abandoned. This application May 17, 1982, Ser. No. 378,557
Int. Cl.³ B41J *3/12, 1/20*
U.S. Cl. 101—93.04 **1 Claim**



1. A dot matrix printing apparatus for printing dots along a desired printing line on a recording paper, comprising:

a platen, said platen extending at least along the desired printing line;

a movable dot font element carrier adjacent to said platen and generally parallel thereto, said carrier traversing the desired printing line;

a plurality of dot font elements in a plurality of sizes connected to said carrier on a surface thereof facing said platen, said dot font elements being spaced apart from each other by at least a first width, said first width being measured along the desired printing line;

a reversible driving means engaging said dot font element carrier for moving said carrier at a predetermined velocity in either direction parallel to said platen to cause said carrier and said dot font elements to traverse the desired printing line in either direction;

at least one impact hammer adjacent to said dot font element carrier and so positioned that said dot font element carrier passes between said impact hammer and said platen, said impact hammer having an impact face width measured along the desired printing line which is at least an integral number of widths of characters in any desired matrix printing format, said impact face width being less than said first width of spacing between said adjacent dot font elements on said carrier;

hammer actuator means connected to said impact hammer for actuating said impact hammer to impact said dot font element carrier each said impact driving at least a portion of said carrier and a said dot font element thereon toward said platen;

timing means connected to said hammer actuating means for timing said impact to occur when a said font element of the desired size is adjacent to a portion of the desired printing line where a printed dot is desired;

means for shifting said paper in a direction generally orthogonal to the desired printing line;

a series of machine-sensible, regularly spaced timing and font size indicating indicia on said font element carrier; and

a sensor for said indicia, said sensor being mounted in a fixed position adjacent to said dot font element carrier for sensing said indicia and developing timing signals for use in actuating said hammers.

4,428,286

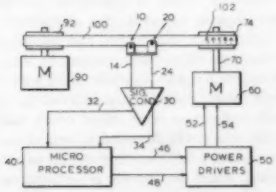
BAND POSITIONING APPARATUS

James DeJager, and Leonard Ward, both of Melbourne, Fla., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 149,970, May 15, 1980, abandoned, which is a continuation of Ser. No. 731,655, Oct. 12, 1976, abandoned. This application Jan. 21, 1982, Ser. No. 341,574

Int. Cl.³ B41J *1/60*

U.S. Cl. 101—111 **20 Claims**



1. A band positioning apparatus for positioning a high speed endless loop printing band of the type used on impact band printers, along an axis perpendicular to the direction of feed, said apparatus comprising in combination:

at least one pulley having a high speed endless loop printing band riding thereon;

a first sensor for generating at an output thereof a first signal responsive to an edge of the endless loop printing band drifting to one side of a reference line, with said reference line being parallel to and defined by the preferred position of an edge of the endless loop printing band;

a second sensor for generating at an output thereof a second signal responsive to the edge of the endless loop printing band drifting to the other side of said reference line;

computer means having a first input coupled to said output of said first sensor and a second input coupled to said output of said second sensor, said computer means for generating at an output thereof correction signals responsive to receiving and comparing said first and second signals; and

step motor means coupled to said pulley for moving said pulley and the endless loop printing band toward said reference line responsive to receiving said correction signals coupled to an input of said step motor means from said computer means.

4,428,287

METHOD FOR PRODUCTION OF IMPRESSIONS OF ACCURATE REGISTER ON PRINTING PRESSES

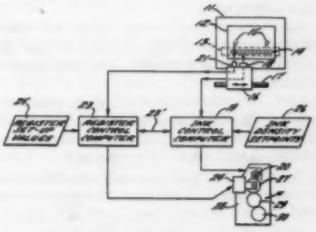
Harry M. Greiner, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,566

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136705

Int. Cl.³ B41F *13/24;* **B41J** *33/00*

U.S. Cl. 101—170 **9 Claims**



1. A method for the production of high-quality multi-colored printed sheets, the printed sheets being printed in a printing press having means for adjusting the density of ink applied to the sheets and means for adjusting plate cylinder register, the method comprising the steps of:

printing an ink density check strip on the sheets characterizing the density of ink applied to the sheets,

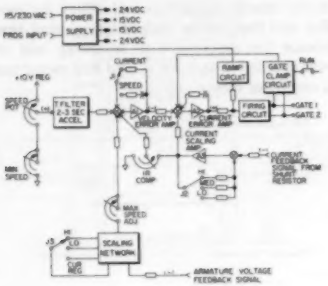
printing at least one alignment mark on the sheets characterizing the positional accuracy of the application of ink by the printing press, the alignment mark being printed at the same time that the ink density check strip is printed,

thereafter scanning the alignment mark and the ink density strip at the same time, determining therefrom respective register alignment measured values and ink density measured values at the same time, and determining control values for register and ink density adjustment at the same time from the register alignment and ink density measured values.

4,428,288
ADJUSTABLE DRIVE SYSTEM FOR MATCHING SURFACE SPEEDS OF A TRANSFER ROLL AND PLATE ROLL AND METHOD THEREOF

James R. Harper, Charlotte, and Charles L. O'Klatner, Denver, both of N.C., assignors to Harper Corporation of America, Charlotte, N.C.

Filed Apr. 26, 1982, Ser. No. 371,721
Int. Cl.³ B41F 13/12
U.S. Cl. 101—248 **6 Claims**



1. A device for applying ink in flexographic printing comprising:

a plate roll of a fixed diameter rotatably mounted to said frame means;

an ink transfer roll rotatably mounted to said frame means and contacting along an area of contact said plate roll, said transfer roll having an outside surface holding ink thereon transferable to said plate roll upon joint rotation thereof, said surface being of a material to allow reformation to delete any damaged wear reducing the outside diameter of said transfer roll to a measurable diameter;

first drive means associated with said plate roll and operable to drivingly rotate said plate roll over a range from a low speed to a high speed;

counting means connected to said plate roll operable to continuously measure rotational speed of said plate roll over said range and to produce a counting signal proportional thereto;

control means connected to said counting means receiving said counting signal and operable to allow manual adjustment thereof producing an adjusted signal proportional to said counting signal over said range; and,

second drive means engaged with said transfer roll and said control means to receive and adjusted signal and drivingly rotate said transfer roll as a function of said adjusted signal and proportional to the rotation of said plate roll as the diameter of said plate roll is to the diameter of said transfer roll and allowing the tangential surface speed of said transfer roll to continuously match along said area of contact the tangential surface speed of said plate roll over said range.

4,428,289
PRECISION VERTICAL REGISTRATION ADJUSTMENT DEVICE FOR A PRINTING PRESS

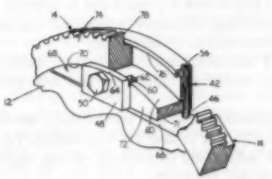
Gary R. Fair, 3613 Princetown Ct., Lacey, Wash. 98503

Continuation-in-part of Ser. No. 256,091, Apr. 21, 1981, abandoned. This application Apr. 8, 1982, Ser. No. 366,725
Int. Cl.³ B41F 13/14
U.S. Cl. 101—248 **5 Claims**

1. A precision vertical registration adjustment device for a printing press of the type having a master cylinder driven by a circular master cylinder drive gear; wherein said master cylinder drive gear is releasably secured to the periphery of one end of said master cylinder with at least one master cylinder drive gear clamp bolt; wherein an opening is provided between said master cylinder and said master cylinder drive gear; wherein said printing press has an installed control handle means for selectively loosening and tightening said at least one master cylinder drive gear clamp bolt to permit selective relative rotation between said master cylinder and said master cylinder drive gear; and wherein said device comprises:

shoe means, wherein said shoe means defines a master cylinder drive gear slot which is adapted to accept a corresponding part of said master cylinder drive gear to permit said corresponding part of said master cylinder drive gear to be selectively firmly engaged by said master cylinder drive gear slot when said device is installed on said master cylinder drive gear;

locking means comprising a locking clamp means and locking clamp drive means, wherein said locking clamp drive means extends between and is adapted to interconnect said shoe means and said locking clamp means when said device is installed on said master cylinder drive gear; and wherein said locking clamp means and said shoe means are adapted to be selectively driven by said locking clamp drive means to selectively tightly sandwich and release said master cylinder drive gear between said locking clamp means and said shoe means, to selectively releasably secure said device to said master cylinder drive gear when said device is installed on said master cylinder drive gear; and



vertical registration adjustment means carried by said shoe means, wherein said vertical registration adjustment means comprise a pair of adjustment screws carried by said shoe means; wherein said adjustment screws are spaced apart from each other and are adapted to bear against the same side of said opening between said master cylinder and said master cylinder drive gear to selectively rotate said master cylinder and said master cylinder drive gear with respect to each other when said adjustment screws are selectively actuated to extend one of said adjustment screws while the other of said adjustment screws is retracted, when said device is installed on said master cylinder drive gear;

wherein when said device is installed on said master cylinder gear, a portion of at least one of said shoe means and said locking clamp means is adapted to pass through said opening between said master cylinder and said master cylinder drive gear; and wherein when said device is installed on said master cylinder gear, said locking clamp drive means is sized and located to be adapted to permit said installed control handle means on said printing press to be used to drive said locking clamp drive means.

4,428,290

DEVICE FOR AXIALLY RECIPROCATING AN INKING-UNIT ROLLER OF A ROTARY PRINTING MACHINE

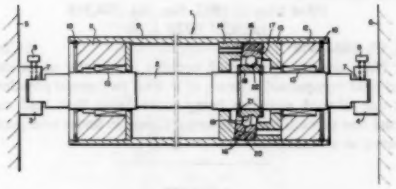
Rudi Junghans, Wilhelmsfeld, and Hermann Beisel, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,196

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 8015906[U]

Int. Cl.³ B41F *31/14*; B41L *27/16*

U.S. Cl. 101—348 **4 Claims**



1. Device for axially reciprocating an inking-unit roller of a rotary printing machine having a fixed shaft and a frictionally driven roller shell mounted for rotation about the fixed shaft comprising a pair of rings formed with opposing circular roller tracks disposed within the inking-unit roller and respectively secured to the shaft and the roller shell, one of said rings being skewed in axial direction with respect to the other of said rings, and a ball rollably received in both of the roller tracks and actuatable for effecting a step-down in speed of the axial reciprocatory motion of the inking-unit roller, said pair of rings being a radially inner ring secured to the shaft and a radially outer ring, and including an elastic bearing ring having a spherical bearing surface circumferentially surrounding and engaging said radially outer ring, said radially outer ring being engaged through the intermediary of said elastic bearing ring with the roller shell and mounted axially skewed relative to said radially inner ring, and further including respective spacer rings disposed at both sides of said bearing ring and engaging the roller shell for guiding said bearing ring.

4,428,291

INKING UNIT FOR A PRINTING PRESS

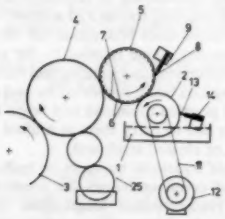
Joachim Dorow, Neuhofen, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,784

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117341

Int. Cl.³ B41F *31/06*, *31/26*

U.S. Cl. 101—350 **20 Claims**



1. In an inking unit for a printing press designed for printing from a hard printing plate as a printing image carrier having a printing image screen thereon and mounted on a printing plate cylinder, said inking unit using a high viscosity ink and comprising:

(a) a fountain roller;

(b) a form roller for inking said printing plate running against and at the same surface speed as said plate cylinder and having a diameter equal to the working diameter of said plate cylinder;

(c) an ink drum roller for forwarding ink from said fountain roller to said form roller having a different diameter than said form roller, wherein said ink drum roller is turned at the same surface speed as said form roller and at a different surface speed than said fountain roller, said ink drum roller having a screen pattern of ink takeup pockets separated by lands on an outer surface thereof, said pattern being a little finer than the printing image screen on said printing plate; and

(d) a stripping means for clearing ink from said lands of said screen pattern on the outer surface of said ink drum roller.

4,428,292

HIGH TEMPERATURE EXPLODING BRIDGE WIRE DETONATOR AND EXPLOSIVE COMPOSITION

Robert A. Riggs, Grand Prairie, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 5, 1982, Ser. No. 439,477

Int. Cl.³ C06B *33/10*; F42C *19/12*

U.S. Cl. 102—202.7 **20 Claims**

1. An explosive composition capable of initiation by an exploding bridge wire comprising:

from about 25 percent to about 50 percent by weight of hexanitrostilbene;

from about 40 percent to about 70 percent by weight of a perhalogenate oxidizing agent;

from about 1.5 percent to about 6 percent by weight of a sensitizing metal, and

from about 0.0006 percent to about 20 percent by weight of copper ions provided by a suitable copper compound source.

11. An electrical detonator comprising:

an electrically insulated container;

an explodable bridge wire positioned within said container and connected to a pair of electrically conductive wires which penetrate said container to provide a means of introducing an electrical charge into said bridge wire, and

an explosive composition contained within said container comprising from about 25 percent to about 50 percent by weight of hexanitrostilbene, from about 40 percent to about 70 percent by weight of a perhalogenate oxidizing agent from about 1.5 percent to about 6 percent by weight of a sensitizing metal, and from about 0.0006 percent to about 20 percent by weight of copper ions.

4,428,293

GUN-LAUNCHED VARIABLE THRUST RAMJET PROJECTILE

Leo Botwin, Westport, and John A. Simpson, Southport, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1980, Ser. No. 217,970

Int. Cl.³ F42B *15/10*

U.S. Cl. 102—381 **6 Claims**

1. A variable thrust ramjet weathercock stable projectile suitable for launching from a gun, comprising:

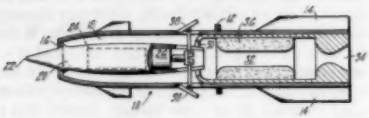
a casing having an air inlet which operates as a supersonic diffuser to increase the pressure of air entering said inlet;

a duct means leading from said inlet to a combustion chamber in which a fuel is burned, a nozzle means positioned in said casing near the rear end of said combustion chamber through which hot gases are exhausted providing thrust to said ramjet;

bleed means positioned in said casing, and opening into said duct, said bleed means being adjustable between a closed

position in which no air is bled from said duct and an opened position in which air is bled from said duct;

control means connected to said bleed means for moving said bleed means between its opened and closed positions, said control means including means for measuring any error in an initial ideal muzzle velocity imparted to said



projectile during launching and for measuring any subsequent velocity deviation from a preselected velocity profile of a ballistic vacuum trajectory; and

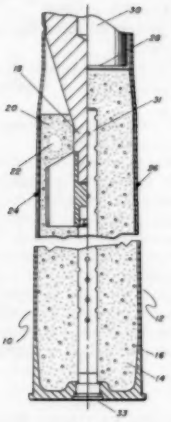
whereby said projectile is maintained in a thrust-drag balance such that it follows a predetermined vacuum ballistic trajectory.

4,428,294

FINLESS GUN-FIRED PRACTICE ROUND

Edmund W. Falkowski, Montague, and Michael J. Kolasa, Garfield, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 16, 1982, Ser. No. 408,316
Int. Cl.³ F42B *13/20*
U.S. Cl. 102—444 **5 Claims**



1. A finless gun-fired practice round which comprises:

a cartridge case;

a single base propellant operatively disposed in said cartridge case;

a centrally disposed perforated igniter for igniting said propellant;

primer means axially positioned in said cartridge case for activating said igniter;

a cylindrically shaped warhead operatively staked in said cartridge case which includes;

a cylindrically shaped hollow after body having an internally threaded open end and a closed end, an annular slip band groove, and an annular cartridge wall groove therein;

an obturator slip band operatively disposed in said slip band groove;

a spike nose member threadedly attached to said open end of said after body, said spike nose member having a difference in density over said after body equal to or greater than 2.5 to 1 and a configuration designed to maintain the warhead center of gravity forward of the warhead aerodynamic center of pressure by a longitudinal distance equal to greater than 0.5 calibers; and

a cup shaped wear liner operatively disposed intermediate the inner wall of said cartridge and said single base propellant and intermediate the rear end of said after body and said single-base propellant.

4,428,295

HIGH DENSITY SHOT

Venkataramaraj S. Urs, Godfrey, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed May 3, 1982, Ser. No. 374,363
Int. Cl.³ B22F *3/00*
U.S. Cl. 102—448 **6 Claims**

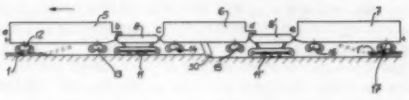
1. High density shot which consists essentially of an unsintered cold-compacted mixture of at least two metal powders, a first one of such powders being more dense than lead and a second one of such powders being flowable under compaction to serve as a binder.

4,428,296

RAILROAD TRACK RELAYING TRAIN

Fredy Scheuchzer, Lausanne, and Fritz Buhler, Ecublens, both of Switzerland, assignors to Les Fils d'Auguste Scheuchzer S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 30,818, Apr. 17, 1979, Pat. No. 4,307,667. This application Aug. 4, 1981, Ser. No. 289,902
Claims priority, application Switzerland, Apr. 19, 1978, 4178/78
Int. Cl.³ E01B *27/11, 29/05*
U.S. Cl. 104—2 **8 Claims**



1. A train for relaying railroad track in a relaying zone comprising:

(a) cars for transporting ties and fixing means,

(b) a sequence of working cars comprising at least a car for removing old rails and ties or track panels, a ballast excavating car, and track relaying car, each of said working cars carrying working instrumentalities and having at both ends bogies adapted to run on rails;

(c) a coupling frame between each two consecutive working cars and connected by universal joints with adjacent ends of said cars, said coupling frames carrying no working instrumentalities,

(d) at least one track-laying or caterpillar truck supporting each of said coupling frames and adapted to move on the ballast or cleared track bed, means for raising and lowering said coupling frame relative to the respective track and means for driving and steering said trucks, said ends of said working cars being supported by said coupling frame in its raised position to unload said bogie trucks adjacent to said ends and to carry them in a lifted position above said ballast or cleared track bed,

(e) controllable hydraulic bumpers or buffers on opposite ends of said coupling frames for keeping the coupling frames in predetermined longitudinal relation to said working cars between which said coupling frames are disposed, and

(f) guide members provided at the end of a working car adjacent a coupling frame and bearing on the adjacent end of the respective coupling frame for keeping the chassis of

said car in the proper transverse parallel position in relation to the coupling frame.

4,428,297

RAILWAY TRACK TAMPING MACHINE

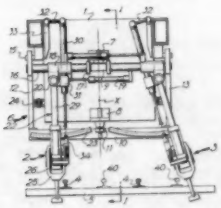
Jorg Ganz, Etoy, Switzerland, assignor to Sig Societe Industrielle Suisse, Schaffhausen, Switzerland

Filed Feb. 26, 1982, Ser. No. 352,755

Claims priority, application Switzerland, Mar. 5, 1981, 1465/81

Int. Cl.³ E01B 27/16

U.S. Cl. 104—12 2 Claims



1. A railway track tamping machine whose rolling chassis (1) is equipped with at least two tamping units (2, 3) for compacting the ballast on opposite sides of two lines of rail, each having at least two oscillating, pivoting tools (25) in the form of articulated levers arranged on a tool holder (26) mounted for vertical movement in a gantry (22) which can be inclined in a plane transverse to the track to permit the tamping of track switches and in which the said gantry is also movable in a longitudinal direction of the track with respect to the chassis in order to permit tamping along each oblique tie of the said switches without having to displace the said rolling chassis in said direction, characterized by the fact that the tamping units (2, 3) are mounted on a single vertical frame (6) mounted for pivoting around a central vertical axis (X) on two spaced brackets (7, 8) fastened to the chassis (1); by the fact that said frame has at least one linear fixed slideway (16) perpendicular to its axis of pivot on which there is mounted, for each tamping unit, a slide (18) moved by a drive member (19) and on which the gantry (22) of said tamping unit is mounted for pivoting in a plane parallel to said frame; by the fact that the pivoting of said gantry in the slide and the translation of the latter on the slideway are coordinated by a coordinating rod (32) connecting an element of the gantry which is remote from its articulation to a fixed element in the transverse direction of the track; and by the fact that the lower portion of the said gantry has a retention element (34) engaged in a second slideway (23) remote from the slide and fastened to the frame.

4,428,298

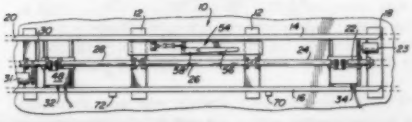
VEHICLE SPEED CONTROL TRANSITION MODULE

Stanley K. Gutekunst, Nazareth, and John M. Sipos, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 14, 1981, Ser. No. 330,352

Int. Cl.³ B61B 13/12

U.S. Cl. 104—166 9 Claims



1. Apparatus for controlling the speed of a driverless vehicle comprising a stationary frame having an upstream end and a downstream end, said frame supporting first, second and third aligned drive tubes between tracks which are adapted to support a driverless vehicle, the ends of said second tube being at all times spaced from the adjacent ends of the first and third tubes, a first motor coupled to the first drive tube for rotating the same about its longitudinal axis at a first speed, a second motor coupled to the third drive tube for rotating the same about its longitudinal axis at a second speed which is different from said first speed, control means along the second drive tube for slowing down a vehicle as the vehicle moves along the second drive tube, and clutch means for selectively enabling only the first motor to drive said first and second tubes at the same speed and then enable only the second motor to drive said second and third tubes at the second speed with a smooth transition between the first and second speeds.

4,428,299

ARRANGEMENT FOR TRANSFERRING CARRIERS AT POWER LINE DISCONTINUOUS PORTION OF POWER-AND-FREE TROLLEY CONVEYOR

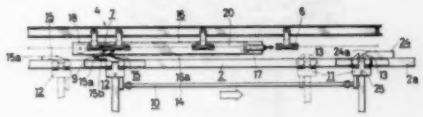
Takao Wakabayashi, Shinsenri-Minamimachi, Japan, assignor to Nakanishi Metal Works Co. Ltd., Osaka, Japan

Filed Nov. 12, 1981, Ser. No. 320,692

Claims priority, application Japan, May 2, 1979, 54-59040[U]

Int. Cl.³ B61B 10/02

U.S. Cl. 104—172 S 1 Claim



1. In a power-and-free trolley conveyor comprising first and second power lines (3), (4) arranged discontinuously as spaced apart from each other by a specified distance and each having a drive chain (6), first and second free lines (1), (2) arranged below the power lines (3), (4) respectively and connected to each other by a free line connecting portion (2a), carriers (10) suspended from the free lines (1), (2) and each having a front free trolley (11) and a rear free trolley (12), the front free trolley (11) being provided with a tilting dog (13), the rear free trolley (12) having a cam (15) attached to its upper end and projecting rearward for accumulating following carriers, the cam (15) being formed at its rear end with a slope (15a) inclined forwardly upward, and a plurality of pusher dogs (7) pivotably provided on the drive chain (6) of each of the power lines (3), (4) and arranged at a specified spacing, each of the pusher dogs (7) being provided at its rear end with a hooked engaging portion (8) and a side projection (9) extending from the engaging portion in at least one sidewise direction, an arrangement for transferring the carriers at the power line discontinuous portion comprising an endless free chain (16) disposed at least at one side of the terminal end of the second power line (4) for restraining the pusher dog (7), the endless free chain (16) having a lower side straight portion (16a) positioned slightly above and in parallel to the path of movement of the side projection (9) on the pusher dog (7), the length of the lower side straight portion (16a) of the endless free chain (16), the length of the carrier (10) between the front and rear trolleys (11), (12) and the length of the free line connecting portion (2a) being predetermined as related to one another, so that when one pusher dog (7) in engagement with the tilting dog (13) on the front free trolley (11) of a carrier (10) on the second free line (2) to pull along the carrier is disengaged from the tilting dog at a location beyond the terminal end of the endless free chain (16), the cam (15) on the rear free trolley (12) of the same carrier (10) is positioned at the starting end of the endless free chain (16), permitting the following pusher dog (7) to come into striking contact with the rear end slope (15a) of the cam (15) and the side projection (9) of the following pusher dog (7) to

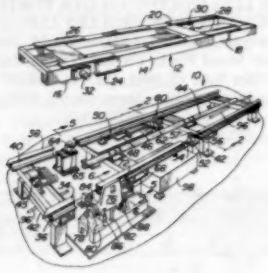
bear against the lower side straight portion (16*a*) of the endless free chain (16) from therebelow, to cause the propelling force of the following pusher dog (7) to move together the following pusher dog (7), the cam (15) on the carrier (10) and the pusher dog bearing portion of the endless free chain (16), the following pusher dog (7) being thereafter disengageable from the cam (15) on the carrier (10) when the front free trolley (11) of the carrier (10) has moved past the free line connecting portion (2*a*) onto the first free line (1).

4,428,300

VEHICLE PRECISION STOP ASSEMBLY

Barry L. Ziegenfus, Saylorsburg, and Russell Scheel, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 14, 1981, Ser. No. 330,353
Int. Cl.³ B61K *7/00*; B61B *13/12*
U.S. Cl. 104—250 **14 Claims**



1. A vehicle precision stop assembly comprising a frame supporting a drive tube between spaced tracks, motor means coupled to said tube for rotating said tube about its longitudinal axis, first means for elevating the vehicle front end so that support wheels thereon are spaced from said tracks, second means for elevating a vehicle rear end so that support wheels thereon are spaced from said tracks, said first and second elevating means being differently spaced from said tracks so that each only contacts its associated end of a vehicle, latch means for selectively latching a portion of a vehicle in a predetermined fore-aft position while the vehicle is in said elevated position, and means for causing a vehicle to stop while in contact with said first and second elevating means.

4,428,301

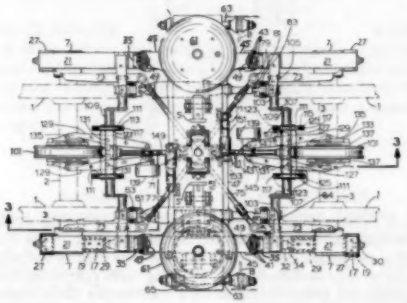
RADIAL AXLE RAILWAY TRUCK

Keith L. Jackson, Granite City, Ill., assignor to Lukens General Industries, Inc., Coatesville, Pa.

Filed Aug. 3, 1981, Ser. No. 289,471
Int. Cl.³ B61F *5/30, 5/38*; B61H *5/00, 13/26*
U.S. Cl. 105—168 **30 Claims**

22. In a railway truck having a wheeled axle, truck framing resiliently supported from said axle, said axle being steerable between a tangent-track position parallel to the transverse axis of the truck frame and a curved track position angulated with respect to the longitudinal axis of the truck frame, brake disc structure centered on said axle, brake shoes mounted directly below said axle for gripping engagement with said disc structure, brake operating mechanism comprising longitudinally extending levers operatively connected to said shoes at substantially the same level as said shoes, a transversely extending structure supported on said axle, a common fulcrum support element for said levers supported from said transversely extending structure and fixed against transverse and angular movements with respect to said axle, and a single longitudinally extending link centered transversely of the truck and pivotally connected at its respective ends to said fulcrum support element and to said truck frame for taking longitudinally acting braking torque reaction from said shoes into said truck frame whereby to oppose inertial longitudinal movement of said truck frame relative to the axle during brake applications and thereby to maintain substantially the normal longitudinal relationship of said axle and said truck framing under braking conditions.

29. In a railway truck having a pair of longitudinally spaced wheel and axle assemblies each comprising an axle and a pair of wheels mounted thereon, bearing structures including journal bearings supported on the end portions of said wheel and axle assemblies at each side of the truck, a longitudinally extending side frame at each side of the truck supported at its ends on said bearing structures and having end portions extending above said bearing structures, a transverse member resiliently sup-



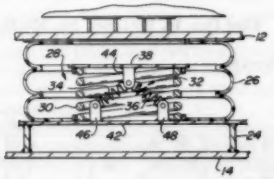
ported on and connecting said side frames, said journal bearing structure having fore and aft surfaces, each said side frame having opposing horizontal surfaces equally spaced vertically from the respective journal bearing horizontal surfaces, said horizontal elastomeric pad devices interposed between the opposed journal bearing structure and side frame surfaces, at least one of said horizontal pad devices associated with each journal bearing structure being elongated in plan with their long dimensions extending transversely of the truck to oppose transverse tilting of the respective side frames, said horizontal pad devices nearest the ends of said side frames being elongated in plan with their long dimensions extending transversely of the truck and said horizontal pad devices remote from the ends of said side frames being elongated in plan with their long dimensions extending longitudinally of the truck.

4,428,302

EMERGENCY SPRING SYSTEM FOR A RAILWAY CAR

James M. Herring, Jr., Merion Station, Pa., assignor to The Budd Company, Troy, Mich.

Filed Feb. 10, 1982, Ser. No. 347,495
Int. Cl.³ B61F *5/06*
U.S. Cl. 105—197 R **3 Claims**



1. In combination with an air spring for supporting a rail car on a bolster of a truck,

an emergency spring system disposed within said air spring

to support said rail car when said air spring fails comprising:

(a) a first spring having a relatively linear spring rate;

(b) a pair of angularly disposed mechanical springs each having one end pivotally connected to a common member with their opposite ends being pivotally connected to said bolster having a relatively sinusoidal spring resistance to an increasing load produced by said rail car body; and

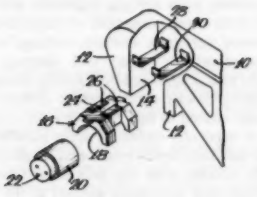
(c) said spring and said pair of angularly disposed mechanical springs being connected in parallel with respect to each other to produce a combined spring resistance including a low spring rate operating range for a range of different loads produced by said rail car body without high vertical car body deflection.

4,428,303

PEDESTAL WEAR PLATE

Carl E. Tack, Elmhurst, Ill., assignor to TransDyne, Inc., Chicago, Ill.

Filed Sep. 28, 1981, Ser. No. 306,090
Int. Cl.³ B61F *5/26, 15/00*
U.S. Cl. 105—225 **4 Claims**



1. In a wear plate of the type having a base and a pair of resilient lips extending from the base and being resiliently clamped over the downwardly facing surface in the pedestal opening of the side frame of a railway truck in order to protect the entire surface, said surface being otherwise subject to wear at longitudinally spaced areas beyond both sides of a central portion thereof, the improvement comprising a pair of individual wear plates spaced longitudinally and engaged over and protecting respective of said spaced areas of said downwardly facing surface on either side of said central portion thereof, each of said wear plates having a base wall and a pair of lips joined to and extending upward from opposite sides of said base wall, said lips being resiliently engageable in clamped relation with opposite sides of said pedestal above the downwardly facing surface thereof, and means for holding said wear plates in said longitudinally spaced relation.

4,428,304

ADJUSTABLE SHELF UNIT

Robert Moser, Eureka, Ill., assignor to Parsons Manufacturing, Incorporated, Roanoke, Ill.

Filed Jun. 15, 1981, Ser. No. 273,682
Int. Cl.³ A47B *1/00*
U.S. Cl. 108—65 **14 Claims**

1. A shelf unit comprising:

two laterally spaced forwardly extending support members;

a rear panel extending between and supported at its ends on said support members;

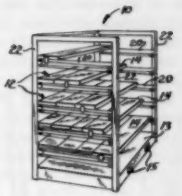
at least one intermediate panel and a front panel, said intermediate panel being slidable over said rear panel and said front panel being slidable over said intermediate panel;

downwardly extending flanges on the ends of each of said panels;

tabs on the rear inner surface of said flanges of said intermediate and front panels;

tabs on the front outer surface of said flanges of said intermediate and rear panels;

whereby said inner tabs engage said outer tabs to limit the forward extension of said front panel with respect to said



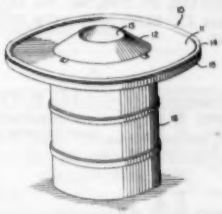
intermediate panel and of said intermediate panel with respect to said rear panel.

4,428,305

TABLE TOP

Edward J. Creske, P.O. Box 1520, Wausau, Wis. 54401

Filed Apr. 6, 1981, Ser. No. 251,545
Int. Cl.³ A47B *3/00*
U.S. Cl. 108—150 **1 Claim**



1. A lightweight table top capable of holding dishes, glasses and the like thereon comprising a generally planar surface, an opening disposed centrally thereof, and at least one circularly disposed array of locking elements provided therewith for securing the same to an open top receptacle with the centrally disposed opening being aligned with said open top;

said locking elements being formed in said planar surface by cutting the same on three sides thereof whereby each can be forced downwardly into engagement with the support, with each locking element being configured to conform to the shape of a surface on said receptacle for securing the same thereto; and

said planar surface having an upwardly tapering cone section positioned within the interior thereof with said section having a depending annularly vertically disposed collar forming said central opening, whereby waste can be easily conducted into said receptacle by pushing the same up the cone surface into said central opening into said receptacle.

4,428,306

PALLET

William L. Dresen, Baraboo, Wis.; William F. Price, Taylor Ridge, Ill., and Harlan W. Breezer, Portage, Wis., assignors to Penda Corporation, Portage, Wis.

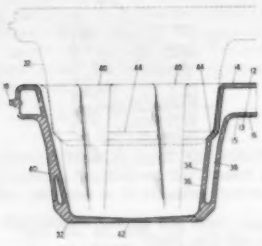
Filed Oct. 9, 1981, Ser. No. 310,052
Int. Cl.³ B65D *19/32*
U.S. Cl. 108—53.3 **17 Claims**

9. A pallet (10) comprising:

a substantially planar load-bearing member (12) formed from an upper sheet of material (13) and a lower sheet of material (15) located generally in fixed parallel relationship to each other; and

a plurality of feet (32) depending from the load-bearing member (12), the feet (32) being formed as a downwardly de-

pending portion of each of the two sheets of material (13, 15) forming an upwardly opening pocket (36) on the interior



thereof, each of the feet (32) including integral solid wall portions (40) formed of deformed portions of both of the sheets of material (13, 15) fused together.

4,428,307

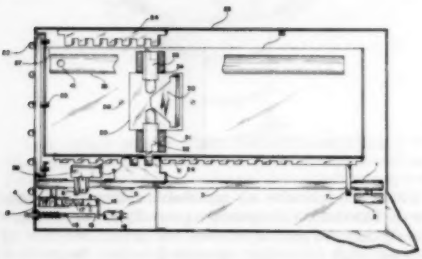
SAFETY CASH BOX

Tulio Vasquez, Carrera 15 No. 39-27, Bogotá, Colombiano

Filed Oct. 30, 1981, Ser. No. 317,145

Int. Cl.[3] E05G *1/04*; A47B *88/00*

U.S. Cl. 109—45 **4 Claims**



1. A safety cash box having a housing body including respective upright sidewalls and respective spaced apart top and bottom walls, back wall and front opening, and a slidable drawer which in the course of its normal operation is movable back and forth toward retracted and extended positions lengthwise within said housing body, said safety cash box comprising:

slide drawer structure including,

a rear drawer section and a front drawer section with said rear and front drawer sections having respective bottom walls and respective upright side walls, said rear and front drawer sections being rigidly joined together by transverse fastening means connecting said respective upright sidewalls of said two drawer sections, wherein said front section is forwardly shiftable respective to said rear section when the breaking down point of said transverse fastening means is exceeded by a force applied to said drawer front section, said slide drawer structure being provided with a thrust bearing member for receiving thereon a backwardly exerted thrust;

motive means including a drawband supporting a thrust applying member thereon,

with said motive means being operably coupled through an idler pulley braking means to a trigger device for triggering said motive means, and with said motive means being further operably coupled through said thrust applying member to a locking arrangement for irreversibly locking said slide drawer when the drawer is drawn backward by the action of said thrust applying member against said thrust bearing member,

said locking arrangement including respective cooperating rack bars and respective ratchet means,

with said rack bars being fixedly joined longitudinally to the underside of the said slide drawer bottom, and said ratchet means being supported on a pivot shaft which is provided with an abutment lug by means of which said pivoting shaft is normally coupled to said thrust applying member of said motive means, said pivot shaft being normally urged by coil spring means which normally act to bring said ratchet means into engagement with said respective rack bars when said thrust applying member ceases to rest on said abutment lug, and

jamming means operable in response to said forward shifting of said drawer front section respective to said drawer rear section when said tranverse fastening means are made to break down, said jamming means including,

one double wedge block fixedly attached to each of said slide-drawer upright sidewalls and outwardly protruding therefrom, said wedge blocks having slanted surfaces with one of the protruding slanting surfaces of said double wedge blocks facing upward and the other slanting surface directed downward,

one set of bolts securely installed on the inner face of each said housing body upright sidewalls, with each of said sets of bolts being comprised of respective upward and downward vertically shiftable locking bolts which are axially extendable when said slanting surfaces are brought into wedge-and-bolt sliding contact when said protruding blocks are forwardly shifted as a result of breakage caused in said transverse fastening means,

pairs of vertically distanced apart parallel top and bottom rack bars firmly positioned lengthwise inside said body housing with one pair of said parallel top and bottom rack bars being located in the same vertical plane containing each set of said shiftable bolts, whereby said upwardly and downwardly shiftable bolts are axially extended to make them go into engagement respectively with said top and said bottom rack bars of each pair of rack bars when said double-wedge block slanting surfaces slide to come into wedge-and-bolt sliding contact with said respective axially extendable bolts, thereby causing said slide drawer to become wedged into said housing body when the said transverse fastening means are stressed beyond their breaking down point.

4,428,308

LINEAR DOWN-DRAFT BIOMASS GASIFIER

Jerry L. Birchfield, Decatur, and Albert P. Sheppard, Jr., Tucker, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Nov. 30, 1981, Ser. No. 326,046

Int. Cl.[3] F23L *15/00*; C10B *49/02*

U.S. Cl. 110—229 **7 Claims**

1. An apparatus for producing combustable gases from carbonaceous biomass comprising:

a reaction vessel having substantially vertical walls and an enclosed top and bottom;

biomass feeding means for feeding moisture controlled biomass into the top of said vessel;

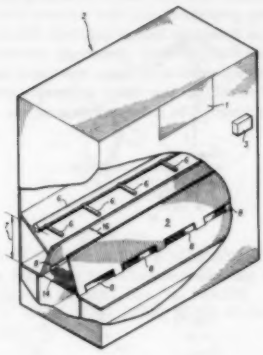
suspension means located between the top and bottom of said vessel having a first and second portion respectively extending from a pair of opposite walls of said vessel;

a long and narrow rectangular grate located below said suspension means and between said pair of opposite walls wherein the length of said grate is substantially equal to the distance between the other pair of opposite walls of said vessel;

combustion air introduction means located substantially adjacent and above said fuel suspension means for introducing preheated air into the portion of the biomass located near the opening formed by the distance between said first and second portions of said suspension means

along the entire length of said vessel determined by said other pair of opposite walls;

producer gas removal means located between said suspension means and said grate for removing gas produced by the combustion of said combustion air and said moisture controlled biomass;



first heat removing means for removing a first portion of heat from said producer gas supplied from said gas removal means for supplying heating air to said combustion air introduction means; and

second heat removing means for removing a second portion of heat from said producer gas removed by said gas removal means for supplying heat to control the moisture content of said biomass.

4,428,309

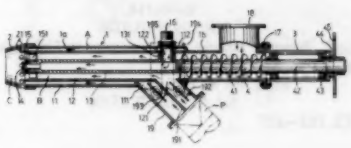
PULVERIZED-COAL AND LIQUID-FUEL DUAL-PURPOSE BURNER

Shien-Fanh Chang, 55, Chung Cheng Rd., Hsin Yin Chen, Tainan Hsien, Taiwan

Continuation of Ser. No. 310,400, Oct. 9, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,547

Int. Cl.³ F23C *1/10*; F23Q *9/00*

U.S. Cl. 110—262 **4 Claims**



1. A pulverized-coal and liquid-fuel burner comprising:

a main body including:

a front member comprising an outer pipe, an intermediate pipe, and an inner pipe, said pipes being coaxially and telescopingly arranged, said outer pipe including a secondary-air inlet in a lower side thereof, and said intermediate pipe including a primary-air inlet located adjacent said secondary-air inlet and adjacent a rear end of said inner pipe, said outer, intermediate, and inner pipes including holes at their rear ends, which holes are aligned,

a threaded liquid-fuel inlet pipe extending through said holes and projecting beyond said outer pipe, said liquid-fuel inlet pipe securing said inner pipe within said intermediate pipe,

a discharge nozzle attached to a front end of said inner pipe, and

a rear member formed integrally with said intermediate pipe and including a port disposed on an upper side of a rear end thereof for the reception of pulverized coal,

a flame spout detachably secured to the front end of said main body and tapering-down in diameter toward its discharge end, said flame support including a peripheral wall having a plurality of holes therein spaced rearwardly from the discharge end of said flame spout,

an air inlet pipe joined to said front member in encompassing relationship to said primary-air and secondary-air inlets for introducing air into said outer and intermediate pipes, said air inlet pipe being inclined toward said rear member so as to be disposed at an inclined angle relative to the axis of said front member, said air inlet pipe being divided into one primary air duct and one secondary air duct by a partition wall, both air ducts having an air regulating valve assembled therein,

a supporting sleeve connected to a rear end of said rear member by removable fasteners,

bearings mounted in front and rear ends of said supporting sleeve,

a driven shaft mounted within said bearings so as to be aligned with said inner pipe, said shaft including a helical screw at a front end thereof to define a screw conveyor for conveying pulverized coal forwardly from said port, a front end of said screw thread terminating immediately adjacent said rear end of said inner pipe and said primary-air inlet and

means for rotating said shaft.

4,428,310

PHOSPHATED ALUMINA AS SLAG MODIFIER

George T. Kekish, Naperville, and Diep V. Xieu, Aurora, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 26, 1982, Ser. No. 401,740

Int. Cl.³ F23B *7/04*

U.S. Cl. 110—342 **25 Claims**

1. A process for increasing the fusion temperature of slag resulting from the combustion of a solid fuel, said slag having a silica content in excess of about 60 weight percent on a total 100 weight percent slag basis comprising admixing with a material selected from the group consisting of said slag and precursers of said slag at least one composition from the class consisting of phosphated aluminas.

4,428,311

PATTERN SELECTING DEVICE FOR SEWING MACHINES

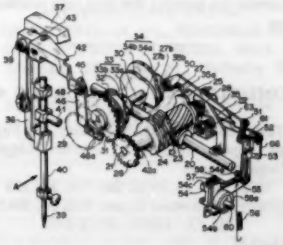
Yasuro Sano, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,352

Claims priority, application Japan, Dec. 24, 1980, 55-184822[U]

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 A **4 Claims**



1. A pattern selecting device for a sewing machine having a housing, a rotatable main shaft and a swingable and reciprocally movable needle bar, comprising at least one pattern se-

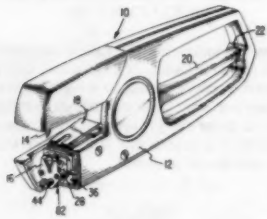
lecting cam operated by a rotatable pattern selecting dial; a cam shaft operatively connected to the main shaft; a first cam group on said cam shaft and having a number of cams for swinging the needle bar and adapted to be rotated at a predetermined speed reduction with respect to the speed of the main shaft; an operating shaft extending parallel to said cam shaft; a second cam group on said operating shaft and having a number of cams for swinging the needle bar and adapted to be rotated at further reduced speed with respect to said first cam group, said pattern selecting cam and said dial being mounted on said operating shaft; and an amplitude transmission lever operatively connected to the needle bar and having a first follower engageable with said first cam group, said amplitude transmission lever being provided with a first member having a second follower engageable with said pattern selecting cam, and a second member having a third follower engageable with said second cam group, said second follower being controlled by said pattern selecting cam so that said first follower engages one of the cams of said first cam group when said third follower disengages from one of the cams of said second cam group and said third follower engages with one of the cams of said second group when said first follower disengages from one of the cams of said first cam group.

4,428,312

LOOP POSITIONING ARRANGEMENT FOR DOUBLE POINTED LOOPER SEWING MACHINE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 22, 1983, Ser. No. 506,757
Int. Cl.³ D05B *1/06*
U.S. Cl. 112—199 **6 Claims**



1. In a sewing machine, a frame, a thread carrying needle arranged for reciprocating motion in the frame, a looper having two loop seizing points, a cam which has the looper affixed thereon and is mounted for pivotal movement in the machine, actuating means for effecting said motion thereby alternately disposing each of the said two looper points for seizing a loop of thread extending to one side of the needle, at least one raised surface on said cam engageable with the thread on the opposite side of the needle for moving the loop into position for looper point seizure.

4,428,313

ELECTROMECHANICAL ACTUATOR FOR A SEWING MACHINE

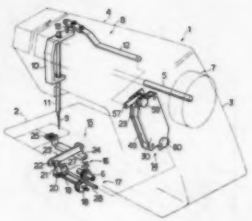
Michitaka Takiguchi; Nobuyuki Naganuma, and Fujio Horie, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

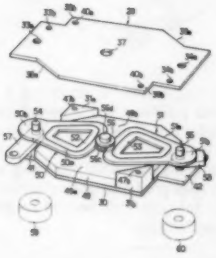
Filed Jan. 25, 1982, Ser. No. 342,111
Claims priority, application Japan, Jan. 30, 1981, 56-13690
Int. Cl.³ D05B *69/10, 3/02*
U.S. Cl. 112—220 **6 Claims**

1. In a sewing machine having a plurality of regulating mechanisms operative to influence the formation of successive stitches, an electromechanical actuator for positionally controlling the regulating mechanisms comprising;

(a) a magnetic frame including two inner walls which define a single air gap therebetween.

(b) permanent magnet means supported on at least one of said two walls to produce at least one set of two uniform magnetic fields within said air gap, said two magnetic fields being opposite to each other in direction,





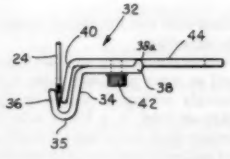
(c) a plurality of planar armatures pivotally mounted on said frame and respectively connected with said plurality of regulating mechanisms, each of said plurality of planar armatures carrying a planar exciting winding, said exciting winding being placed in said two magnetic fields to impart reversible movement to each of said plurality of planar armatures.

4,428,314

NEEDLE GUIDE

Ronnie C. Renaud, Liberty, S.C., assignor to Universal Sewing Supply Inc., St. Louis, Mo.

Filed Jul. 6, 1981, Ser. No. 281,002
Int. Cl.³ D05B *55/06*
U.S. Cl. 112—227 **1 Claim**



1. A sewing machine which includes a needle guide and a reciprocating looper which in cooperation with a reciprocating needle forms stitches in a fabric being sewn on the sewing machine wherein said needle guide comprises:

a horizontally extending elongated member;

a downwardly depending guide surface carried adjacent one end of said elongated member;

an elongated slot provided in said elongated member;

spaced vertically inclined inner and outer surfaces joined at a lower end to define a "U" shaped member;

a horizontal leg integral with an upper end of said inner surface;

a vertically extending positioning post carried on an end of said horizontal leg;

a bolt means for adjustably connecting said horizontal leg to said elongated member with said positioning post extending into said slot provided in said elongated member and said downwardly depending guide surface extending in between said inner and outer surfaces so that the spacing between said depending guide and said outer leg can be adjusted to accommodate needles of different sizes.

4,428,315

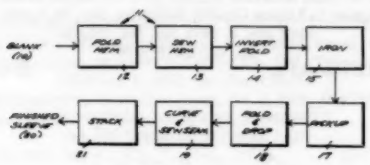
AUTOMATIC SLEEVE MAKING

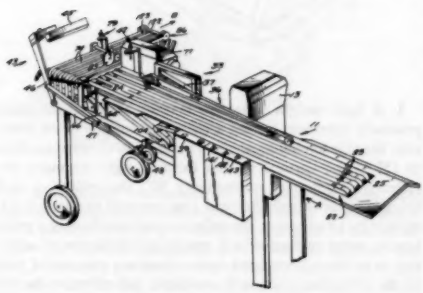
John H. Keeton, P.O. Box 296, Campbellsville, Ky. 42718

Filed Jan. 31, 1984, Ser. No. 319,671

Int. Cl.³ D05B *97/00, 21/00, 35/00, 27/00*

U.S. Cl. 112—262.3 **22 Claims**





1. A method of automatically forming a shirt sleeve from a sleeve blank, comprising the steps of sequentially:

(a) conveying the blank in a first direction so that a first edge thereof moves substantially parallel to said first direction;

(b) automatically forming a hem along said first edge;

(c) automatically picking up the hemmed sleeve blank and folding it about an axis substantially transverse to said first edge;

(d) conveying the folded, hemmed blank in a second direction substantially transverse to said first direction, so that a second edge thereof is generally parallel to said second direction; and

(e) automatically stitching along said second edge to stitch overlapped portions of the folded blank together to form a shirt sleeve.

7. A method as recited in claim **1** wherein steps (a) and (b) are practiced so that said first direction is horizontal, and so that said hem is facing upwardly.

4,428,316

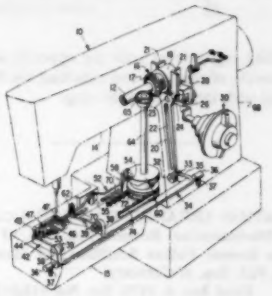
FEED SYSTEM FOR A SEWING MACHINE

John Patricia, Elizabeth, and Jan Szostak, Lincroft, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 14, 1982, Ser. No. 398,023

Int. Cl.³ D05B *3/04, 27/02*

U.S. Cl. 112—323 **2 Claims**



1. A feed system for a sewing machine having a frame, a horizontal arm shaft journalled in said frame, a vertical arm shaft extending downwardly from adjacent said horizontal arm shaft, means rotatably connecting said horizontal arm shaft to said vertical arm shaft, said feed system comprising a cam fixed to said horizontal arm shaft, a sheet metal feed fork having parallel bent over portions at one end thereof embracing said cam and in driving engagement therewith, a feed rock shaft supported in said frame and having an arm connected to the other end of said feed fork, feed regulating means carried by said frame and connected to said feed fork for converting motion induced by said feed cam to oscillations of said rock shaft, said rock shaft being formed with a pair of upright rock arms on the other end thereof, a horizontally disposed U-shaped sheet metal feed dog carrier having each end thereof connected to one of said upright rock arms, said feed dog carrier having a horizontal shelf extending from the base of the U between the ends thereof, said shelf supporting thereon a feed dog, means for attaching said feed dog to said shelf, a stud affixed to said base of said feed dog carrier beneath said shelf, a sheet metal lift lever pivotally supported on a horizontal axis in said frame substantially parallel to said rock shaft, said lift lever having a slotted end for engagement with said stud extending from said feed dog carrier, said lift lever having the other end thereof supporting a cam follower adjacent said vertical cam shaft, and a lift cam removably affixed to said vertical cam shaft and in engagement with said cam follower on said lift lever.

4,428,317

REINFORCED OPENING

Emerson T. Oliver, 239 Ocean Ave., Marblehead, Mass. 01945; Brian P. Doyle, 6 Whittier Pl., Boston, Mass. 02114, and Philip R. Marriner, 182 Cedar St., Wellesley Hills, Mass. 02181

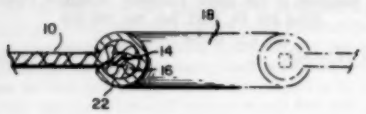
Filed Aug. 24, 1981, Ser. No. 295,534

Int. Cl.³ B63H *9/08;* **A43C** *5/00*

U.S. Cl. 114—114 **9 Claims**

1. A reinforced opening in sheet material comprising a rigid ring of multi-sided cross section wherein the intersection of the sides define edges spaced about the cross section, said ring being positioned about the opening at one side of the sheet material with a width of the sheet material bounding the opening folded from the one side through and outwardly of the ring at the other side, said ring enfolded by said width of sheet material at the edge of the opening constituting a bead bounding the opening and a liner element positioned within the

opening bounded by the bead with portions folded symmetrically outwardly over the surfaces at opposite sides of the bead into clinching engagement with the opposite surfaces of the sheet outwardly of the bead and clinching the folded sheet in engagement with the edges of the ring.



4,428,318

VENTILATION ARRANGEMENT FOR A CARGO SHIP

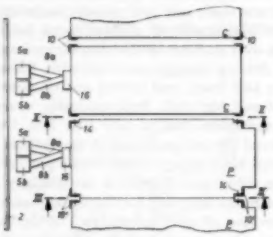
Hans M. Huchzermeier, Bremen, Fed. Rep. of Germany, assignor to Bremer Vulkan Schiffbau und Maschinenfabrick, Bremen, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,011

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726076

Int. Cl.³ B63J *2/00*

U.S. Cl. 114—211 **22 Claims**



18. A marine cargo pallet comprising a hollow base of standardized substantially rectangular plan configuration and dimension, an air inlet opening laterally into the base interior at one end thereof, the structure of the pallet defining the air inlet opening being substantially flush with the adjacent end of the base so as not to project significantly laterally therefrom, the base having a top load-bearing surface, and air flow outlet opening means at least through the base top surface from the interior of the base, the base being closed save for the opening and the opening means to serve as a plenum for flow of air therethrough from the opening to the opening means.

4,428,319

SOCK SKIMMER DEPLOYMENT

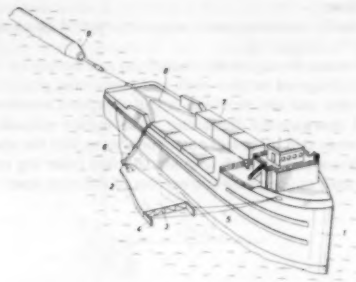
Dean L. Henning, Needville; Lewis M. Clark, III, Houston, and John M. Ward, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1979, Ser. No. 32,043

Int. Cl.³ B63B *21/00, 27/14;* B01D *43/00*

U.S. Cl. 114—253 **9 Claims**

1. Apparatus for removing oil from the surface of a body of water comprising, an at least partially flexible, elongated chamber having an open, at least partially submerged front for receiving the water and oil thereinto during relative movement between the chamber and the body of water; at least one inclinable ramp for launching and retrieving the chamber with a vessel; and at least one cable for unfolding the chamber laterally in the water, said cable being slidably connected to at least one extremity of the chamber and fixedly connected to the other extremity of the chamber.



4,428,320

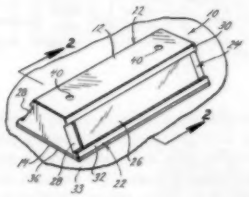
REFLECTIVE PAVING MARKER

David W. Oplt, Belleville, Ill., and Fred G. Peil, St. Louis, Mo., assignors to Lukens General Industries, Inc., St. Louis, Mo.

Filed Jun. 8, 1981, Ser. No. 271,416

Int. Cl.³ E01F *9/06*

U.S. Cl. 116—63 R **10 Claims**



1. A light weight reflective marker having a substantially prismatic form and having a reflective surface on at least one side, the side having an angle of inclination of between about 5° to 15° to the vertical so that incident light impinges on the reflective surface at substantially 90°, the reflective surface being a piece of reflectorized tape secured to the side of the marker by an adhesive, the reflectorized tape having a polycarbonate outer surface which resists accumulation of adhesive dirt over the reflectorized tape, wherein a substantial portion of the reflective marker is available and effective to reflect back incident light and remains effective in use.

4,428,321

THERMALLY-ACTIVATED TIME-TEMPERATURE INDICATOR

Robert P. Arens, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Nov. 16, 1981, Ser. No. 321,372

Int. Cl.³ G01N *33/02;* G01K *1/02*

U.S. Cl. 116—217 **9 Claims**

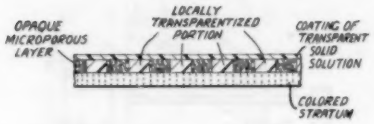
1. An article for irreversibly displaying visual evidence of exposure within a predetermined temperature range for at least a predetermined length of time, comprising in combination:

a. an opaque open cell microporous diffusely light-reflective layer having first and second surfaces and being formed of components which will not melt at the upper end of said predetermined temperature range,

b. a colored stratum firmly joined to the first surface of said microporous layer, and

c. overlying, but not appreciably penetrating, at least a portion of the second surface of said microporous layer, a substantially transparent coating of a composition comprising a solid solution of

(1) an amorphous rubbery polymer having a glass transition temperature below the lower end of said predetermined temperature range, dissolved in



(2) a crystallizable solvent for said rubbery polymer, said solvent having a melting point below the lower end of said predetermined temperature range,

the solvent:polymer ratio being selected to control viscosity and assure wicking penetration of the entire depth of said microporous layer by said composition at the expiration of said predetermined length of time in said temperature range to thereby make the colored stratum visible.

4,428,322

INDICATOR MECHANISM IN A PUSHBUTTON TUNER

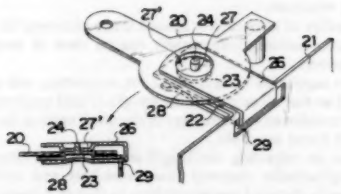
Takao Chaki; Nobuaki Watanabe, and Takao Kanai, all of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,471

Claims priority, application Japan, Jul. 3, 1980, 55-92849[U]; Jul. 7, 1980, 55-94537[U]; Jul. 9, 1980, 55-95596[U]

Int. Cl.³ G01D *13/22*; H03J *1/02*

U.S. Cl. 116—261 **10 Claims**



1. In an indicator mechanism in a pushbutton tuner, said mechanism including an arm member pivotally mounted at a base end portion thereof to a stationary element in said tuner and provided with an indicating pointer at the opposite end thereof; a generally planar member pivotally connected to said arm member and having a first bore passing between the major faces thereof; a plate member extending from a casing of the pushbutton tuner; bearing means for pivotally mounting said planar member to said plate member; operating means connected between a pushbutton of the pushbutton tuner and said planar member for causing pivotal movement of the planar member and thereby displacing said arm member as said operating means is moved, the improvement wherein said bearing means comprises:

a generally cylindrical projecting first protrusion formed outwardly extending from a first face of said plate member and projecting into and receiving said first bore formed in said planar member so as to pivotally support said planar member; and

a holding member having an open rectangular configuration formed by a first and a second generally parallel spaced confronting plates having inner and outer ends, and interior face of said first confronting plate bearing against a second face of said plate member and on interior face of said second confronting plate extending over said first face of said plate member, said confronting plates being resiliently joined at the outer ends of said confronting plates so as to captively hold said planar member against said plate member with said bore of said planar member pivotally surrounding said first protrusion;

a smaller second protrusion disposed on one of said second confronting plate and said first protrusion, the other of said second confronting plate and said first protrusion having a second bore therein configured to closely receive said second protrusion.

4,428,323

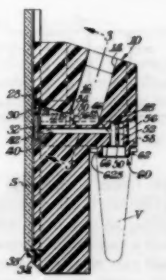
CHAMBER BLOCK HAVING A SAMPLE DAM AND A SUPERNATANT REENTRY BARRIER THEREIN

John R. Wells, Culver City, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1982, Ser. No. 443,859

Int. Cl.³ B05C *13/02*; B04B *11/00*

U.S. Cl. 118—52 **4 Claims**



1. In a chamber block adapted for removable insertion into a centrifuge rotor, the block being of the type having an inlet channel into which a sample is introduced and an outlet channel through which the sample moves in response to a centrifugal force field toward a deposition surface, wherein the improvement comprises:

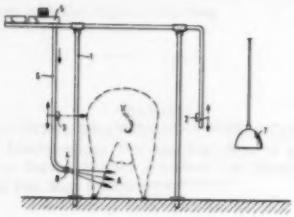
a dam formed within the block and cooperating with the structure of the block to define a well on the interior thereof to receive the sample and to prevent the sample from flowing through the block in the absence of a centrifugal force field.

4,428,324

METHOD AND APPARATUS FOR PREVENTING PIGLETS FROM SUFFOCATING UNDER THE DAM IN A BROODING PEN

Ensio Salminen, 21890 Haveri, Finland

PCT No. PCT/FI81/00075, § 371 Date May 25, 1982, § 102(e) Date May 25, 1982, PCT Pub. No. WO82/01300, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 9, 1981, Ser. No. 385,657
Claims priority, application Finland, Oct. 10, 1980, 803228
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 12 Claims



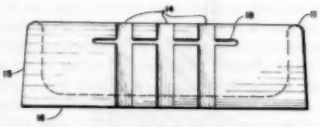
3. A method of preventing the young of a parent animal from being harmed under the parent animal comprising:
detecting when the parent animal rises; and
establishing a flow of air in a flow direction under the parent animal when it has risen.

4,428,325

FEEDING BOWL AND LINER THEREFOR

Charlotte M. Koch, 28796 Roberts Rd., Shedd, Oreg. 97377

Filed May 28, 1982, Ser. No. 383,035
Int. Cl.³ A01K *5/01*
U.S. Cl. 119—61 7 Claims



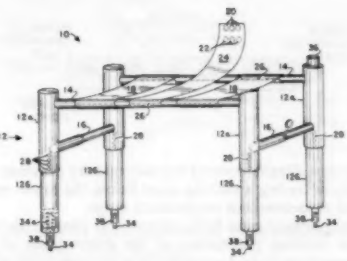
1. An improved pet feeder comprising:
(a) a durable bowl-shaped holding receptacle of monolithic construction having an upwardly concave open interior contoured to have a long axis of symmetry and a short axis of symmetry, said axes being in perpendicularly bisecting juxtaposition, an upper rim, a circumferential exterior sidewall having a plurality of substantially vertically oriented elongated recesses in symmetrically opposed disposition about said long axis, and horizontally oriented elongated recesses in paired opposition about said long axis, and a substantially flat exterior base,
and
(b) a resilient liner of uniformly thin construction contoured to secure close-fitting contact with the interior of said receptacle and extend over said rim and downwardly in contact with said exterior sidewall, and having indented portions adapted to engage said horizontally oriented recesses.

4,428,326

INFIRMED PET AMBULATOR

Carol A. Dubovick, and Marion R. Drake, both of P.O. Box 1897, New Port Richey, Fla. 33568

Filed Apr. 1, 1982, Ser. No. 364,438
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—102 6 Claims



1. An apparatus for partially or completely supporting a domesticated quadruped suffering from infirmities which impede or disable it from normal locomotion, comprising,
a frame assembly,
said frame assembly having a plurality of upstanding leg members disposed in longitudinally and transversely spaced relation to one another to define a generally rectangular configuration when seen in plan view,
each of said leg members supported by a caster means mounted at the respective lowermost ends thereof for rotatable engagement with a support surface,
a plurality of longitudinally disposed brace members for rigidly interconnecting longitudinally spaced ones of said leg members,
a plurality of transversely spaced brace members for rigidly interconnecting transversely spaced ones of said brace members,
means supported by said frame for supporting said quadruped so that all or part of the weight of said quadruped can be transferred from the legs of the quadruped to the legs of said frame assembly,
means for adjusting the length of said leg members, said longitudinally disposed brace members and said transversely disposed brace members so that said frame assembly can be adjusted to accommodate pets of differing heights, lengths, and widths,
said leg members, and said longitudinally and transversely disposed brace members being of tubular construction, each of said members comprising first and second bifurcated, axially aligned, telescoping portions,
and dichotomous locking means being provided so that the length of each member can be changed when said locking means is disengaged and fixed when said locking means is engaged.

4,428,327

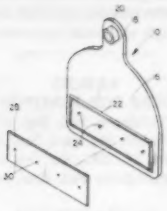
INSECTICIDE EAR TAG

Lester M. Steckel, Box 235, Taylor, Nebr. 68879

Filed Aug. 16, 1982, Ser. No. 408,472
Int. Cl.³ A01K *13/00, 29/00*
U.S. Cl. 119—156 1 Claim

1. An ear tag for an animal, comprising,
a flat portion having opposite sides,
means extending from said flat portion for attachment to the animal's ear,
and an insecticide impregnated flat member detachably secured to said flat portion at least one side thereof
said flat portion having a shoulder integral therewith which extends outwardly therefrom around the periphery of said insecticide impregnated flat member,

said flat portion having a plurality of spaced-apart pegs extending therefrom within the area defined by said shoulder, said insecticide impregnated flat member having a plurality of openings formed therein which detachably receive said pegs.

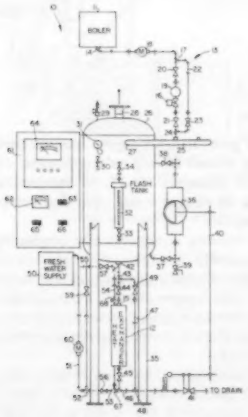


4,428,328

STEAM BOILER HEAT RECOVERY APPARATUS

Richard L. Ratliff, Indianapolis, Ind., assignor to Don Lee Supply, Inc., Indianapolis, Ind.

Filed Nov. 18, 1981, Ser. No. 322,472
Int. Cl.³ F22B *37/48*; F28G *13/00*
U.S. Cl. 122—396 **2 Claims**



1. A steam boiler blowdown heat recovery apparatus which comprises:

blowdown water conduit means for conveying blowdown water from a boiler to a heat exchanger, said blowdown water conduit means including an inlet connectable to the boiler and an outlet connectable to the heat exchanger;

fresh water conduit means for conveying fresh water from a water supply to a heat exchanger, said fresh water conduit means including an inlet connectable to the water supply and an outlet connectable to the heat exchanger;

blowdown water control means for controlling the discharge of blowdown water through the blowdown water conduit means from the boiler to the heat exchanger;

fresh water control means for controlling the flow of fresh water through the fresh water conduit means from the water supply to the heat exchanger;

a heat exchanger including a first flow path for the blowdown water and a second flow path for the fresh water, the first flow path having an inlet connected with the outlet of said blowdown water conduit means, the second flow path having an inlet connected with the outlet of said fresh water conduit means and an outlet connectable with the boiler;

blowdown water flow measurement means for measuring the instantaneous volumetric flow of blowdown water from said boiler through said blowdown water conduit means and through said heat eschanger;

fresh water flow measurement means for measuring the instantaneous volumetric flow of fresh water from said water supply through said fresh water conduit means and through said heat exchanger;

flow meter display means for displaying the instantaneous volumetric flow of blowdown water and of fresh water as measured by said blowdown water flow measurement means and said fresh water flow measurement means, respectively;

energy measurement means for measuring the amount of energy transferred in said heat exchanger from the blowdown water to the fresh water; and

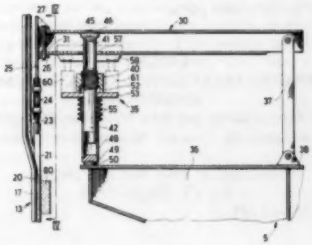
energy meter display means for displaying the amount of energy transferred from the blowdown water to the fresh water as measured by said energy measurement means.

4,428,329

STEAM GENERATOR SUPPORT STRUCTURE

Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Aug. 17, 1982, Ser. No. 408,927
Claims priority, application Switzerland, Sep. 9, 1981, 5812/81
Int. Cl.³ F22B *37/24*
U.S. Cl. 122—510 **11 Claims**



1. In combination,

a steam generator having a pair of vertical flues and a transverse flue connecting said vertical flues together at upper ends thereof, each said vertical flue having a plurality of tubes secured together in seal-tight relation to form tube banks with a first vertical flue enclosing a combustion chamber;

a support structure for supporting said steam generator; and

a bearing system mounted on said support structure below said transverse flue and supporting at least one vertical flue thereon in a region immediately below said transverse flue.

4,428,330

PISTON FOR INTERNAL COMBUSTION ENGINES

Yoshiaki Shimizu, Fujisawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,819
Int. Cl.³ F01P *3/10*
U.S. Cl. 123—41.35 **2 Claims**

1. An oil cooled piston cast in one piece from cast iron for an internal combustion engine, comprising:

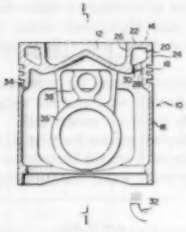
a head portion having a transverse top end crown wall, a combustion chamber defining wall and a side wall formed with ring-receiving grooves;

a hollow open ended skirt portion depending from said head portion;

a pair of transversely spaced bushing-like pin bearing bosses located inside of said skirt portion in symmetrical relation to a plane passing through the longitudinal axis of the piston;

a pair of spaced longitudinal webs depending from said top end wall in parallel symmetrical relation to the piston axis and being connected to the tops of said pin bearing bosses for supporting same; and

a substantially annular cooling oil chamber provided in said



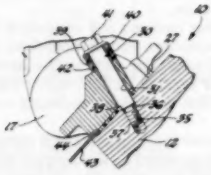
head portion in coaxial relation thereto and adjacent to said top end wall and to at least first ring-receiving groove, said chamber being bounded by said top end wall, said side wall and said combustion chamber defining wall whereas upper portion of each longitudinal web forms a bottom wall of said cooling oil chamber, said bottom wall being generally inclined uniformly inwards from top to bottom and having formed therein a plurality of casting holes one of which serves for an oil inlet port and the other for oil outlet ports.

4,428,331

V-TYPE ENGINE INTAKE WITH VIBRATION ISOLATED MANIFOLD

Daniel M. Zang, Canton, and John W. Huber, Plymouth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1981, Ser. No. 299,620
Int. Cl.³ F02B *75/18*
U.S. Cl. 123—52 MV **3 Claims**



1. In combination in a V-type engine having a pair of angularly disposed cylinder banks extending from a common crankcase and defining an intermediate valley,

intake manifold means secured to and connecting with both said cylinder banks to carry charging air from a common supply and diverging outward to cylinders in said cylinder banks, and

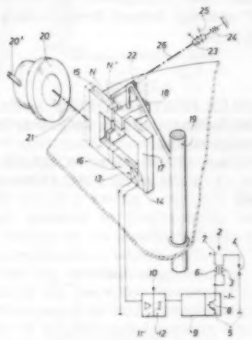
isolation mounting means between and solely connecting said manifold means and said cylinder banks to limit the transmission of noise creating vibrations between the cylinder banks and to the manifold means, said isolation mounting means including resilient vibration isolating gaskets between and engaging each of said cylinder banks and said manifold means to seal joints and prevent direct contact therebetween, and isolated controlled compression securing means acting between said manifold means and said cylinder banks for retaining said manifold means on said cylinder banks with predetermined partial compression of said gaskets while preventing non-resilient solid contact between the manifold means and the cylinder banks through said securing means.

4,428,332

TRANSDUCER FOR IGNITION TIMING

Hartmut Brammer, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,290
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041314
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—146.5 A **3 Claims**



1. A pulse generator for engine ignition timing comprising:

a magnetic circuit having as components therein a magnet (15), and elements (16,17) of magnetically conducting material, an air gap being provided between two of said components;

means for causing a magnetically conducting body (18) to pass repeatedly through said air gap in a closed path when the engine of which the ignition is to be timed is running;

a sensor (13) responsive to changes in magnetic flux mounted on an element of said magnetic circuit for producing an electrical signal in response to a sudden change of flux, and

means for shifting at least one of said components of said magnetic circuit out of its normally fixed position relative to the remainder of said components, and shifting it back so as to reduce the flux provided to said sensor by said magnet, in response to changes in an operation parameter of said engine, for advancing the ignition timing when shifting said at least one component out, and likewise for retarding the ignition timing when said at least one component of said magnetic circuit is shifted back to increase the flux provided by said magnet to said sensor.

4,428,333

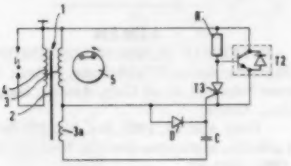
ELECTRONIC IGNITION DEVICE FOR COMBUSTION ENGINES

Werner Erhard, Cadolzburg, Fed. Rep. of Germany, assignor to Helga Müller-Dutschke, Cadolzburg, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,197
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1981, 3152015
Int. Cl.³ F02P *1/00, 1/08*
U.S. Cl. 123—149 C **7 Claims**

1. In an electronic ignition device for combustion engines wherein an ignition coil is coupled to the combustion engine by a magnet wheel, the primary circuit of the coil is interrupted at the desired ignition instant by a circuit transistor switch,

wherein the transistor switch is switched on by means connected between its base and collector and is blocked by a control component at the desired ignition instant, the improvement comprising an auxiliary circuit comprised of an auxiliary



coil magnetically coupled to the ignition coil, a capacitor connected to be charged by the auxiliary coil by way of a diode, the control path of the control component being connected in parallel with the auxiliary circuit.

4,428,334

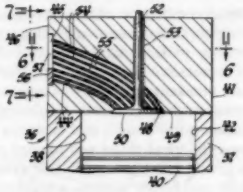
ENGINE WITH VARIABLE FLOW CONTROLLED CELLULAR INTAKE PORT

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1981, Ser. No. 323,188

Int. Cl.³ F02M *35/10*

U.S. Cl. 123—188 M **4 Claims**



1. In an internal combustion engine having at least one cylinder with a closed end,

an intake port through the cylinder closed end and extending from an entrance portion in an exterior wall of the engine to a valve seat adjacent an interior wall of the cylinder,

cellular passage defining transversely intersecting walls extending longitudinally of the intake port from its entrance portion to adjacent said valve seat to direct inlet gas flow in a plurality of separate generally parallel cellular flow paths having transverse dimensions substantially less than those of the port and extending through predetermined portions along substantially the total length of the port, and

adjustable valve means at the port entrance portion and movable to selectively open a desired number and grouping of said cellular flow paths whereby the amount and location of gas flow delivery to the cylinder is adjustably controlled.

4,428,335

ENGINE INTAKE PORT WITH ANNULAR NOZZLE DIRECTED SWIRL

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1981, Ser. No. 332,170

Int. Cl.³ F02F *1/42*

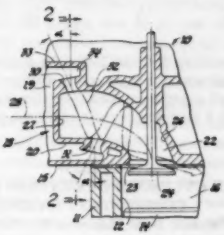
U.S. Cl. 123—188 M **3 Claims**

1. A flow directing inlet port for an internal combustion engine having a cylinder closed at one end, said port comprising

a tubular wall defining an open passage devoid of sharp bends and extending at one end through said cylinder closed end to an annular valve seat, the other end of said passage being closed by an end wall,

a poppet valve having a head seatable on the valve seat to close the passage against communication with the cylinder and a stem extending into the passage from the head and through one of said passage walls for reciprocably supporting the valve head for movement into open and closed positions,

a plurality of inlet nozzles extending through the walls of said passage and comprising the sole means for conducting primary inlet fluid into said passage, said nozzles being directed generally tangentially of the interior of the tubular passage defining wall and offset at a predetermined lead angle toward the cylinder end of the passage with



respect to planes normal to the passage axis so as to direct fluid flow into the passage in a helical flow pattern within the passage having a spiral lead angle substantially determined by the lead angle of the nozzles, all of said nozzles being offset longitudinally of the passage and so located as to direct flow into substantially the same helical path within the passage to define, supplement and reinforce a single lead pattern of helical flow in the passage having a predetermined primary flow path leading to discharge into the cylinder with a predetermined primary flow direction determined by the primary flow path in the passage, and

fluid supply means connecting with the nozzles to supply primary inlet fluid thereto for delivery to the inlet port and thereby to the cylinder.

4,428,336

INLET VALVE ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

Anthony O. Dye, Girton, and David Littlechild, Oakington, both of England, assignors to Epicam Limited, London, England

Continuation of Ser. No. 854,384, Nov. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 685,671, May 12, 1976, abandoned. This application Feb. 26, 1979, Ser. No. 15,238

Claims priority, application United Kingdom, May 28, 1975, 23332/75

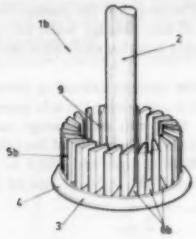
Int. Cl.³ F01L *3/06*

U.S. Cl. 123—188 VA **41 Claims**

1. An inlet valve assembly including a valve having a valve head, a valve stem and a valve seat for an internal combustion engine having at least one cylinder, comprising:

gas distribution means connected to said valve head for creating gas turbulence in the form of small eddies in said cylinder which decays to form a pattern of isotropic turbulence such that at the time of combustion, said small eddies are sufficiently small as to reduce cycle to cycle variation and which comprises at least one ring of separate, circumferentially spaced walls defining between them passages which serve, when the valve is open, to divide gas passing between the valve head and said seat into a plurality of circumferentially spaced jets, each of said jets having a radial component of motion, said pas-

sages having a length at least twice their width, a cross-sectional area of outlet ports of the passages being not more than a cross-sectional area of intervening wall ends and said cross-sectional area of said outlet ports of said



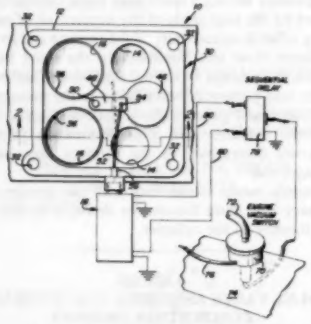
passages being 50% to 25% of a total area between said valve and said seat in an open position wherein said walls are joined together at a base portion thereof and are open ended at a portion opposite said base portion.

4,428,337

VARIABLE CYLINDER OPERATION OF INTERNAL COMBUSTION ENGINE

William D. Parsons, 5408 Manrison Dr., Cross Lanes, W. Va. 25313

Filed Jul. 14, 1981, Ser. No. 285,372
Int. Cl.³ F02D *17/02*
U.S. Cl. 123—198 F **7 Claims**



1. In combination with a combustion engine of the type including an intake manifold defining a pair of air and fuel passages extending therethrough for supplying a fuel and air charge to separate sets of cylinders of a multicylinder engine and wherein the manifold includes a mounting face through which the inlet ends of said passages open for registry with the outlet end portions of corresponding air and fuel passages extending through a carburetor secured over said mounting face; an insert plate mounted between said mounting face and said carburetor, said insert plate having a pair of openings formed therethrough registered with said inlet ends and outlet end portions, valve means shiftably supported from said plate for movement between one of three positions, including a first position totally closing only one of said openings in the plate and with the second plate opening unobstructed to the flow of fluids therethrough, a second position totally closing only the other of said plate openings and with said one plate opening unobstructed to the flow of fluids therethrough and a third out-of-the-way position switch each of said pair of plate openings unobstructed to the flow of fluids therethrough.

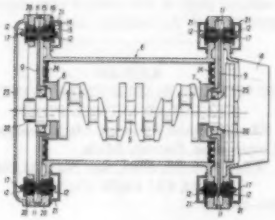
6. The method of increasing the life and fuel economy of a carburetor equipped combustion engine of the multicylinder type and including a pair of air and fuel intake passages for supplying an air and fuel mixture to separate sets of said cylinders, said method including totally blocking alternate intake passages of said engine downstream from the associated carburetor responsive to sequential periods of operation of said engine.

4,428,338

INTERNAL COMBUSTION ENGINE

Othmar Skatsche; Gerhard Feichtinger; Helmut Melde-Tuczai, and Bruno Schukoff, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Apr. 28, 1982, Ser. No. 372,549
Claims priority, application Austria, May 13, 1981, 2145/81; Jun. 29, 1981, 2893/81
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—198 E **10 Claims**



1. An internal combustion engine having a crankcase and an engine unit support, said engine unit support comprising such sound-generating parts as cylinders, cylinder head, pistons, piston rods, crankshaft bearings, crankshaft, and being attached to said crankcase by means of several sound-insulating and force-transmitting elements insulating said crankcase against structure-borne sound, said elements being of substantially hollow-cylindrical shape and located outside of the oil-wetted area in said crankcase with their axes being parallel to the axis of said crankshaft, wherein a bracket with at least two arms is mounted at least at the output end of said engine unit support, said bracket being attached to the bearing seat of said crankshaft, and provided with at least one of said sound-insulating elements at each end of said arms, and wherein said sound-insulating elements are positioned symmetrically to said crankshaft axis.

4,428,339

ROTARY ENGINE

Shmuel Fromer, 10 Reiness St., Kiryat-Shmuel, Haifa, Israel

Filed Oct. 5, 1981, Ser. No. 308,515
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—245 **15 Claims**

1. A rotary power/work engine, comprising

a circular housing defining an annular space therein,

two block-like pistons disposed within said housing and having respective first sides,

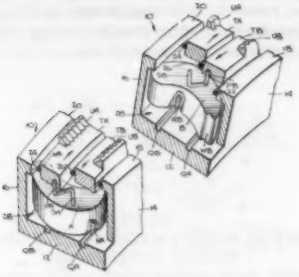
said pistons being arranged for orbital movement in opposite directions within said space and so as to sequentially and at each of two opposite locations in said housing come into and separate out of a face-to-face engaging state in which said first sides face each other,

at least one of said pistons having a concavity at said first side thereof so that a sealed chamber is defined between said pistons when the same are in said face-to-face engaging state thereof,

means for effecting at each of said locations a first rotational movement of said pistons as a unit about an axis of the unit by 180° in one sense while said pistons are in said face-to-face engaging state,

means for effecting a second rotational movement of each of

said pistons individually by 180° in a sense opposite to said one sense upon separation of said pistons after completion of said first rotational movement,



power/work transmitting means located externally of said housing, and

means for coupling each piston to said power/work transmitting means.

4,428,340

DIRECT INJECTION DIESEL ENGINE WITH A MECHANICALLY CONTROLLED INJECTOR

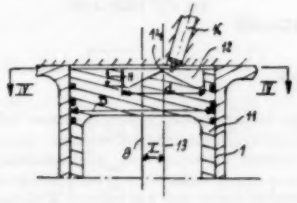
Jean Nikly, Caluire, France, assignor to Automobiles M. Berliet, Lyons, France

Continuation of Ser. No. 952,337, Oct. 18, 1978, abandoned. This application Mar. 29, 1982, Ser. No. 362,775

Claims priority, application France, Oct. 18, 1977, 77 32000

Int. Cl.³ F02B *23/06*

U.S. Cl. 123—276 **7 Claims**



1. A diesel engine of the type having a cylinder block with a top surface, a bottom surface opposite said top surface, and at least one cylinder bore extending from said top surface to said bottom surface, said at least one cylinder bore having a first predetermined diameter and a central axis; a piston mounted in said at least one cylinder bore for reciprocating from a first predetermined bottom position; a cylinder head mounted to said top surface of said cylinder block, said cylinder head further having an inlet valve, an exhaust valve mounted adjacent said inlet valve and means for communicating said inlet and exhaust valves with said at least one cylinder bore; a source of fuel; air intake source means; mechanical fuel injection means mounted in said cylinder head adjacent to said at least one cylinder bore and said fuel source for injecting fuel into said at least one cylinder bore; a camshaft member mounted in said cylinder block; means for rotatably driving said camshaft such that said camshaft rotates in turned relationship with the reciprocation of said piston from a first predetermined top position to a second predetermined bottom position, wherein the improvement comprises:

a combustion cavity recessed a predetermined depth into said piston, said combustion cavity having an outer diameter and a central axis located a predetermined eccentric distance from the central axis of said at least one cylinder bore; said predetermined depth of said recess being from 0.20 to 0.50 times the outer diameter of said combustion cavity; said predetermined eccentric distance being equal to or less than one tenth of said first predetermined diameter of said at least one cylinder bore;

an intake port surrounding said inlet valve for receiving said air source means;

a spiral contoured inlet passage located in said intake port such that said air intake source means entering said intake port is swirled tangentially into said combustion cavity when said inlet valve opens to communicate with said at least one cylinder bore; and

said mechanical fuel injection means further comprising injection means connected to said camshaft for injecting pressurized and metered fuel into said at least one cylinder bore in response to the direct mechanical actuation of said camshaft such that the correct amount of pressurized fuel is supplied into said at least one cylinder bore in relation to the rotation of the engine free of the use of an injection advance device responsive to engine speed, said injection means further comprising a fuel nozzle having a central axis and a tip extending into said combustion cavity, said tip being located a predetermined distance from the central axis of said at least one cylinder bore; said fuel nozzle further being inclined at a predetermined angle with respect to the central axis of said combustion cavity, said central axis of said fuel nozzle being a third predetermined distance from said central axis of said at least one cylinder bore when measured along a plane coinciding with said first predetermined top position of said piston, whereby when said inlet valve is opened, air from said air intake source means is swirled tangentially into said combustion cavity to mix with fuel injected into said combustion cavity by said mechanical fuel injection means to form a homogeneous combustible mixture so that said mixture reduces fuel consumption in a diesel engine.

4,428,341

ELECTRONIC REGULATING DEVICE FOR RPM REGULATION IN AN INTERNAL COMBUSTION ENGINE HAVING SELF-IGN'TION

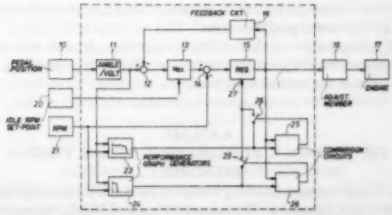
Albin Hassler, Schwieberdingen, and Fridolin Piwonka, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 274,926, Jun. 18, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 484,022

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023350

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—350 **11 Claims**



1. An rpm regulating device in an electronic system for an internal combustion engine having an engine rpm sensor which generates an actual rpm signal, an engine idle rpm transducer which generates an idle rpm set point signal, and an accelerator pedal position sensor which generates a running rpm set point signal, and a selection and comparison means connected to receive said actual rpm signal, said idle rpm set point signal, and said running rpm set point signal to control engine opera-

tion via a fuel injection member in response thereto, said means including,

a comparison means connected to receive and compare instantaneous values of said running rpm set point signal, said idle rpm set point signal and said actual rpm signal, and to generate an rpm difference signal in dependence thereon, and

a PI regulator means connected to said comparison means for receiving said rpm difference signal, in order to generate a fuel quantity demand signal to said engine for controlling said fuel injection member.

4,428,342

METHOD AND SYSTEM FOR OPERATING AN INTERNAL COMBUSTION ENGINE AT OPTIMUM TORQUE

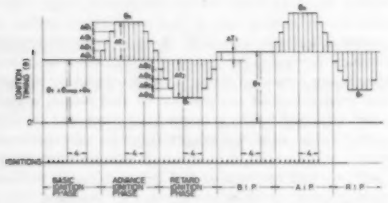
Atsushi Suzuki; Norio Omori; Masakazu Ninomiya; Susumu Akiyama, all of Kariya, and Yuji Hirabayashi, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 22, 1981, Ser. No. 314,022

Claims priority, application Japan, Oct. 22, 1980, 55-148523

Int. Cl.³ F02P 5/08

U.S. Cl. 123—419 **7 Claims**



1. The method of operating an internal combustion engine at optimum output torque under varying operating conditions, said engine having an adjustable input engine variable the setting of which controls the output torque, the method comprising:

oscillating the setting of the input engine variable on each side of a variable reference setting by varying the setting of the input variable by a successively changing fraction of the amplitude of the oscillation so that the oscillation assumes an incremental and decremental staircase value on each side of said variable reference setting;

sensing an output variable representative of said output torque during at least three successive phases of the oscillation;

detecting whether the sensed output variable establishes one of first and second sequential relationships of a plurality of possible sequential relationships indicating that said variable reference setting is on one of first and second sides of an optimum position; and

adjusting said variable reference setting toward said optimum position in response to one of said detected first and second sequential relationships.

4,428,343

TIP-IN KNOCK ELIMINATING SPARK TIMING CONTROL

John F. Schweikert, Sterling Heights; David S. Grossman, Rochester, and Edward E. Durham, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

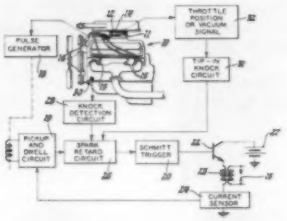
Filed Nov. 23, 1981, Ser. No. 323,821

Int. Cl.³ F02P 5/04

U.S. Cl. 123—425 **2 Claims**

1. A spark timing control system for a spark ignited, multicylinder internal combustion engine subject to knock-induced vibrations and having means effective to normally generate spark events with a predetermined spark timing in relation to crankshaft rotational position, the engine further having an air inlet passage characterized by an inlet air pressure, an abrupt increase in which anticipates a knocking event of limited duration, the system comprising, in combination:

means responsive to a predetermined rate of change of an engine parameter indicating increasing inlet air pressure associated with a sudden throttle opening event to generate a knock anticipating signal; and



means responsive to said signal to temporarily retard spark timing from said predetermined spark timing by a predetermined crank angle and for a predetermined limited time period of fixed duration, the period ending substantially between 175 and 300 milliseconds after the beginning of said sudden throttle opening event, whereby operator perception of such retarded spark timing in engine performance is substantially nonexistent.

4,428,344

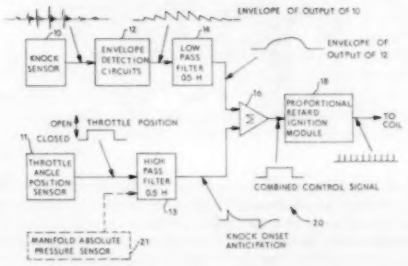
ENGINE KNOCK ANTICIPATION

Louis R. Focht, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 8, 1982, Ser. No. 338,461

Int. Cl.³ F02P 5/04

U.S. Cl. 123—425 **2 Claims**



1. A knock control system for providing a signal suitable for controlling ignition of a vehicle mounted internal combustion engine so as to eliminate knock includes:

a knock sensor means for generating a signal indicating the occurrence of a knock vibration;

an engine operating parameter sensing means for detecting the occurrence of an engine operating parameter related to the occurrence of knock;

said engine operating parameter sensing means including:

a throttle angle position sensor means;

an envelope detection circuit coupled to receive a signal from said knock sensor;

a low pass filter coupled to receive a signal from said envelope detection circuit;

a high pass filter coupled to said throttle angle position sensor means for processing an output signal from said throttle angle position sensor means;

a summer coupled to receive signals from both said high pass

filter and said low pass filter for processing said signals for knock control;

a proportional retard ignition module for receiving said knock control signal to retard the spark timing thereby avoiding knock; and wherein

said knock sensor is an acceleration sensor and said throttle angle position sensor is a resistive slider type sensor.

4,428,345

FUEL METERING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

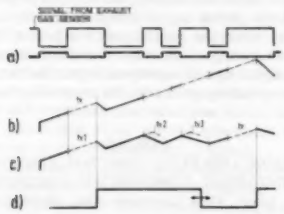
Richard Bertsch, Asperg; Dieter Günther, Murr; Michael Horbelt, Schwieberdingen; Bernd Kraus, Gerlingen; Jürgen Penschuck, Möglingen; Claus Ruppmann, Schwieberdingen, and Hans Schnürle, Walheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,948

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119969; May 13, 1982, 3214059

Int. Cl.³ F02M *7/00, 51/00*

U.S. Cl. 123—440 **15 Claims**



1. In a fuel metering system for an internal combustion engine having an apparatus for regulating the composition of a fuel-air mixture reaching the combustion chambers of the engine, wherein the apparatus includes

a sensor, which is disposed in a flow of exhaust gas from the engine, for generating a control voltage in accordance with the air-fuel ratio of the fuel-air mixture,

a threshold switch, having an input connected to receive the control voltage generated by the sensor and having an output, for generating an output signal which switches from a first level to a second level whenever the sensor control voltage exceeds a predetermined threshold voltage,

an integrator, having an input connected to receive the threshold switch output signal and having an output, for integrating in alternating directions depending upon the threshold switch output signal,

an electronic control unit, connected to receive the integrator output signal, for controlling the composition of the fuel-air mixture in accordance with the integrator output signal, and

first delay means, connected between the output of the threshold switch and the input of the integrator for delaying the switchover of the integrator from one integrating direction to the other integrating direction for a first, predetermined, delay period,

the improvement which comprises:

delay control means for rendering the first delay means inoperative for a predetermined control period after each first delay period.

4,428,346

CONTROL APPARATUS FOR ELECTRICALLY CONTROLLED INJECTION PUMP OF DIESEL ENGINE

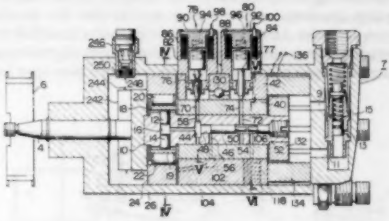
Yoshikazu Hoshi, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,099

Claims priority, application Japan, Jan. 9, 1981, 56-1095

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—450 **8 Claims**



1. A control apparatus for an electrically controlled injection pump of a Diesel engine provided with auxiliary means put into operation in emergency, comprising:

an electrically controlled injection pump provided with an injection timing control solenoid valve and an injection quantity control solenoid valve which are opened in a manner so that the pump operates to supply a desired quantity of fuel to the engine in an optimal injection timing;

a timing signal generator circuit for producing a timing signal synchronized to rotation of said engine;

a main controller circuit for producing an injection timing control signal and an injection quantity control signal for controlling the opening durations of both said solenoid valves in accordance with said timing signal and a first predetermined parameter representative of the operating state of said engine;

a first pulse signal generator circuit for producing a first pulse signal of a fixed pulse width in response to said timing signal;

a second pulse signal generating circuit for producing a second pulse signal in response to said timing signal, said second pulse signal having a pulse width which is varied in dependence on a second parameter representative of a desired operating state of said engine; and

change-over switch means which can be changed over between a first state and a second state, wherein in said first state of said change-over switch, said control signals produced from said main controller circuit are each supplied to a respective one of said solenoid valves, while in said second state of said change-over switch, said first pulse signal produced by said first pulse generator circuit and said second pulse signal produced by said second pulse generating circuit are supplied to said injection timing control solenoid valve as an injection timing control signal and an injection quantity control signal, respectively.

4,428,347

INTERNAL COMBUSTION ENGINE

Jörg Abthoff, Flüderhausen; Haas-Dieter Schuster, Schorndorf; Hans-Joachim Langer, Remseck, and Christoph Noller, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,508

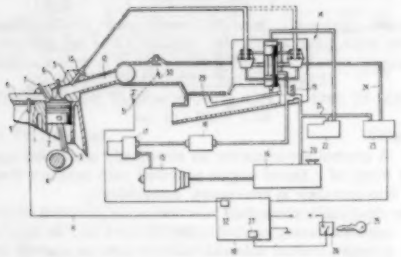
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006369

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—453 **4 Claims**

1. An internal combustion engine comprising a throttle valve means for controlling a rate of flow of air supplied to the

engine, means for injecting fuel in dependence upon a volume of air supplied to the engine, a timing valve means for providing a time relief of injection pressure of the fuel injection means, means for controlling the timing valve means, an ignition starter means for starting the engine, and an operating switch means adapted to automatically close after a termination of a starting operation of the engine, characterized in that means are provided for connecting the ignition starter means with the timing valve means for fully opening the timing valve means during an operation of the ignition starter means for a starting operation of the engine, and in that the controlling means includes an adjustable timing means coupled to the operating switch means for maintaining the timing valve means in the fully open position for a predetermined time span follow-



ing a starting-up of the engine for enabling an after-start operation, in that

the controlling means further includes an exhaust gas sensor means disposed in an exhaust system of the engine, and a control device disposed between the sensor means and the timing valve means, in that

an idler contact means is coupled with the throttle valve means and is adapted to be closed during a closing of the throttle valve means, and in that

the controlling means further includes an additional timing means arranged in the control device for maintaining the timing valve means in a fully open position for a predetermined time period after an opening of the idler contact means so as to enable an acceleration enrichment of the fuel supplied to the engine.

4,428,348

DIGITAL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Sadao Takase; Akito Yamamoto; Katsunori Oshiage, and Akio Hosaka, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1981, Ser. No. 328,026

Claims priority, application Japan, Dec. 10, 1980, 55-173160

Int. Cl.³ F02B *1/06*

U.S. Cl. 123—480 **15 Claims**

1. A digital control system for an internal combustion engine, comprising:

(a) a first sensor for detecting a first engine operating condition and generating a first analogue signal indicative thereof;

(b) a second sensor for detecting a second engine operating condition and generating a second analogue signal indicative thereof, the second analogue signal having a dynamic range less than that of the first analogue signal;

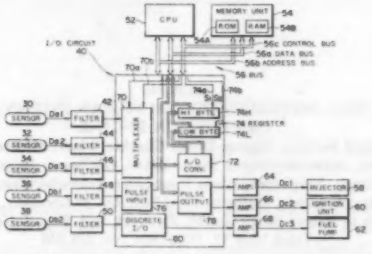
(c) a multiplexer connected to the first and second sensors for selecting either first or second analogue signals;

(d) an analogue to digital convertor connected to the multiplexer for transforming the selected analogue signal into a corresponding digital signal with a first preset number of bits;

(e) a first register connected to the analogue to digital convertor for storing a second present number of sequentially ordered bits of the digital signal starting with the most significant bit, the second preset number being less than the first preset number;

(f) a second register connected to the analogue to digital convertor for storing the remaining bits of the digital signal; and

(g) a control unit connected to the multiplexer for controlling the selection of the first and second analogue signals, the control unit being also connected to the first and



second registers for reading out only the second preset number of bits of the digital signal stored in the first register when the control unit is effective to select the second analogue signal and reading out the first preset number of bits of the digital signal stored in the first and second registers when the control unit is effective to select the first analogue signal, the control unit operative in response to the digital signals corresponding to the first and second engine operating conditions for controlling said engine.

4,428,349

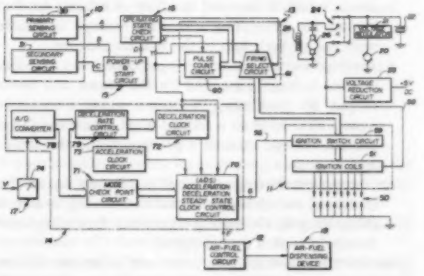
IGNITION AND FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Thomas K. Snow, 1499 Lancaster Ave., Reynoldsburg, Ohio 43068

Continuation-in-part of Ser. No. 39,784, May 17, 1979, abandoned. This application May 27, 1981, Ser. No. 268,093

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—493 **23 Claims**



1. An ignition and fuel control system for internal combustion engines having a combustion chamber for a fuel-air mixture and an ignitor device for the combustion chamber selectively operable to effect ignition of a fuel-air mixture introduced therein, said system comprising

A. ignition circuit means for effecting operation of an ignitor device of a combustion chamber, including

(1) electrical ignition pulse generating means having an output connectable in electrical power transmitting relationship with an ignitor device, and

(2) switching circuit means connected in electric power

controlling relationship to said ignition pulse generating means and provided with an electrical power input connectable to a suitable source of electrical power, said switching circuit means selectively operable in response to concurrent receipt of a firing control clock signal at a first signal input and a clock signal at a second signal input to enable transfer of electrical power to said ignition pulse generating means for generation of an ignition pulse,

B. air-fuel dispensing means including

(1) an air-fuel dispensing device having air flow controlling means and fuel flow controlling means and having selectively operable actuation means operatively coupled with at least said fuel flow controlling means and operably responsive to a control signal, and

(2) an air-fuel control circuit having

a. an input for receiving a clock signal provided thereto, and

b. circuit means operably responsive to a clock signal received at said input to provide a control signal functionally related to said received clock signal at an output thereof, said output connected in electric circuit relationship with said actuation means for said air-fuel dispensing device,

C. timing detector circuit means including

(1) sensing means adapted for disposition in operatively coupled relationship to an engine for sensing the functional operation thereof and to generate a timing signal related to such functional operation, and

(2) firing control circuit means connected with said sensing means and responsive to a timing signal generated thereby for generating a firing control clock signal, said firing control circuit means connected with the switching circuit means of said ignition circuit means to provide the firing control clock signal thereto, and

D. clock and command control circuit means including

(1) an accelerator input control selectively operable to generate an electrical command signal,

(2) an acceleration clock circuit operable to generate a clock signal of a predetermined rate, and

(3) command control circuit means interconnected with said timing detector circuit, acceleration input control and acceleration clock circuit to receive each respective signal thereof and having respective outputs interconnected with the switching circuit means of said ignition circuit means and with said air-fuel control circuit, said command control circuit means responsive to said command signal to provide a clock signal at each of its outputs in accordance with the instant operating mode of the engine, said command control circuit means including a clock control circuit, a deceleration clock circuit operable to generate a deceleration clock signal in response to the command signal generated by said accelerator input control and to the signal generated by said timing detector circuit means and a mode check point circuit, said mode check point circuit responsive to a generated command signal to determine existence of a steady state operation or acceleration or deceleration relative to an immediately preceding operating condition and to provide a respective output signal to said clock control circuit, said clock control circuit operative in response to a deceleration mode signal to provide said deceleration clock signal to said air-fuel control circuit.

4,428,350

HOLLOW CHARGE ENDOTHERMIC MOTOR

Tiziano Cavani, Via Bellaria, 335, Modena, Italy

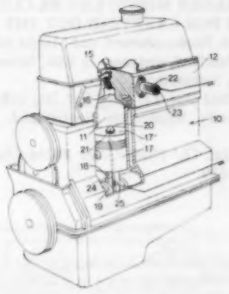
Filed Jan. 19, 1982, Ser. No. 341,159

Claims priority, application Italy, Feb. 11, 1981, 19642 A/81

Int. Cl.³ F02M *27/04*

U.S. Cl. 123—536 **9 Claims**

1. An alternating endothermic engine, comprising a case; a cylindrical chamber in said case; a piston slidable in said chamber and having an end; a portion of said chamber above said piston forming a substantially cylindrical combustion chamber; means for injecting air-fuel mixture into said combustion chamber; means for providing ignition in said combustion chamber situated opposite to said end of the piston and operative to produce an explosive mixture in said combustion chamber, said piston being provided with a projection axially outwardly extended from its end towards said ignition means; first means for charging said projection with electric charges; and second means in said injecting means for charging fuel-air mixture passing therethrough with electric charges, said projection and the mixture passing through the injecting means being charged



with electric charges of the same sign whereby drops of fuel are produced in said combustion chamber to constitute an explosive charge of mixture of air and fuel, said drops due to repulsion between electric charges of said projection and the charged fuel particles being collected at a predetermined distance from said projection so as to form a cavity about said projection and of a shape substantially corresponding to that of said projection but of the size larger than that of said projection so that due to the known per se "Munroe effect" of hollow charges an explosive wave is caused which is concentrated into a substantially cylindrically-shaped jet aligned with said piston and increasing the effect of the explosion.

4,428,351

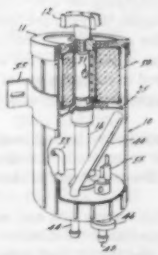
FUEL PROCESSOR APPARATUS

Leland L. Davis, Saline, Mich., assignor to Davco, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 188,875, Sep. 19, 1980, Pat. No. 4,368,716. This application Jul. 27, 1981, Ser. No. 287,149

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **12 Claims**



1. A unitary processing and filtering unit, particularly for diesel fuel and operative to separate out water-impurities from the fuel, comprising a housing including a lower portion defining a combined heating and sediment chamber having a fuel

inlet, a concentric annular shaped filtering means carried by an upper portion of said housing and having a fuel outlet, and means defining a passage for conducting fluid from said chamber to the filtering means, characterized by heating means in said lower portion operative to heat the incoming fuel by direct contact therewith in said chamber, said heating means including a heated portion in close proximity to said passage, and said heating means extends through a substantial part of the lower portion.

4,428,352

PROCESS FOR OPERATING AN INTERNAL-COMBUSTION ENGINE WITH A SUPERCHARGER WHICH CAN BE CUT OUT, AND A DEVICE FOR CARRYING OUT THE PROCESS

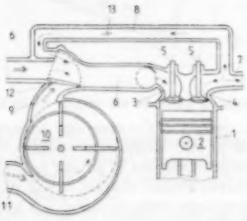
Andreas Mayer, Niederrohrdorf, and Martin Schwarz, Moriken, both of Switzerland, assignors to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Dec. 11, 1981, Ser. No. 329,994

Claims priority, application Switzerland, Dec. 22, 1980, 9453/80

Int. Cl.³ F02B *33/00*; F02M *25/06*

U.S. Cl. 123—559 **2 Claims**



1. A process for operating an internal-combustion engine with a supercharger which can be cut out, comprising:

closing a supercharger delivery line of the supercharger which line opens into an intake pipe by a shut-off member during idling and under low partial load operation of the engine, and, while the supercharger is cut out, sucking intake air in from the atmosphere and mixing a part of the exhaust gases delivered in an exhaust gas return line with the stream of intake air, and supplying the mixture of intake air and exhaust gases to the internal-combustion engine through the intake pipe; and

interrupting the flow of both the exhaust gases and the intake air from the atmosphere with the shut-off member during upper partial load and full load operation of the engine and compressing air from the atmosphere with the supercharger and supplying the compressed air to the internal-combustion engine through the intake pipe.

2. In a device for operating an internal-combustion engine with a supercharger which can be cut out, wherein the supercharger is connected to an intake line of the engine through an exit mouth of a supercharger delivery line, the improvement comprising:

an exhaust-gas return line having an exit mouth opening into the intake line at generally the same cross section of the intake line as the exit mouth of the supercharger delivery line; and

a shut-off member having first and second positions, means for moving said shut-off member to the first position during idling and partial load operation of the engine to close the mouth of the supercharger delivery line and to the second position during upper partial load and full load operation of the engine to simultaneously close both the intake line upstream of the supercharger delivery line and the exit mouth of the exhaust-gas return line.

4,428,353

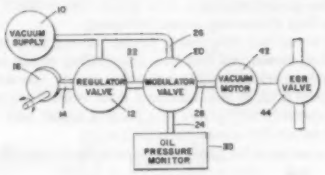
RPM BIAS REGULATOR VALVE

Daniel C. Stahly, Elmhurst, and Andrew A. Kenny, Roselle, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1981, Ser. No. 315,739

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **35 Claims**



1. A vehicular signal modulation system for producing a modulated output signal which varies as a function of at least a first condition and a second condition, the system comprising;

a first transducer for monitoring the first condition and producing a first fluid signal which varies with the first condition;

a second transducer for monitoring the second condition and producing a second fluid signal which varies with the second condition; and,

a modulator valve for modulating one of the first and second fluid signals with the other to produce a modulated output signal which varies with the first and second conditions, the modulator valve including means for converting the second fluid signal to a biasing force and a pressure responsive means operatively connected with the converting means and the first transducer to produce the modulated output signal.

2. The system as set forth in claim 1 wherein the first transducer is a throttle position monitor and the first fluid signal varies with throttle position.

7. The system as set forth in claim 2 wherein the second transducer monitors engine speed and the second fluid signal varies with engine speed.

8. The system as set forth in claim 7 wherein the modulator valve is operatively connected with an exhaust gas recirculation valve for controlling exhaust gas recirculation as a function of the throttle position and the engine speed.

4,428,354

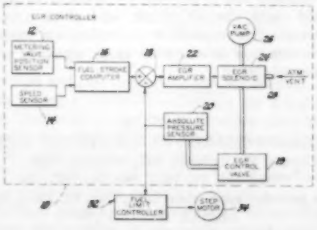
DIESEL ENGINE FUEL LIMITING SYSTEM

Arthur R. Sundeen, Lansing, and Edward R. Romblom, Dewitt, both of Mich., assignors to General Motors Corp., Detroit, Mich.

Filed Jun. 21, 1982, Ser. No. 390,787

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **4 Claims**



1. A fuel control system for a diesel engine having an intake

space into which recirculated exhaust gases are mixed with air and drawn into a combustion space, the amount of recirculated exhaust gases in the uptake space being reduced, after a delay including the time required to purge the excess exhaust gases from the intake space, in response to an increase in an operator commanded fuel amount per engine cycle to prevent a reduction in the air/fuel ratio in the combustion space to a value below an exhaust smoke limit, the fuel control system comprising:

fuel supply means responsive to an operator commanded fuel amount per engine cycle effective to adjust the amount of fuel injected into the combustion space in accord with the commanded amount; and

means effective to limit the change in the amount of fuel injected into the combustion space by the fuel supply means in response to an operator commanded increase in the fuel quantity per engine cycle to a predetermined maximum rate, the maximum rate having a value effective to impose a delay in the increase in the fuel amount per engine cycle during rapid increases in the operator commanded fuel amount per cycle that substantially matches the delay in the resulting decrease in the amount of recirculated exhaust gases in the intake space to prevent the air/fuel ratio in the combustion space from decreasing to a value below the exhaust smoke limit during the delay in the reduction of the amount of recirculated exhaust gases in the intake space.

4,428,355

EXHAUST GAS RECIRCULATION CONTROL FOR INTERNAL COMBUSTION ENGINES

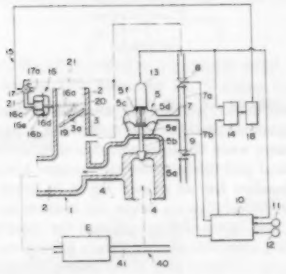
Katsuhiko Yokooku, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 21, 1982, Ser. No. 390,767

Claims priority, application Japan, Jun. 22, 1981, 56-97128; Jun. 22, 1981, 56-97129

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **8 Claims**



1. An internal combustion engine including combustion chamber means, intake passage means leading to said combustion chamber means for providing a supply of intake gas thereto, exhaust passage means communicating with said combustion chamber means for passing exhaust gas from the combustion chamber means, exhaust gas recirculating passage means extending between said exhaust and intake passage means for recirculating a part of exhaust gas in the exhaust passage means to the intake passage means, exhaust gas recirculation control valve means for controlling amount of exhaust gas passing through the recirculation control passage means, valve control means for controlling said valve means in accordance with at least one engine operating condition to thereby control the amount of recirculated exhaust gas, abnormality detecting means for detecting that the valve means is erroneously held in an open position to produce an output signal, corrective means adapted to receive said output signal from the detecting means for improving combustive property of the engine.

4,428,356

DEVICE FOR CONTROLLING AT LEAST ONE THROTTLE DIAMETER IN A CONTROL LINE

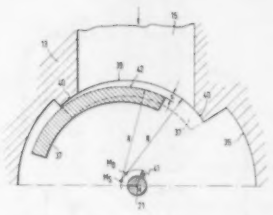
Ulrich Kemmner, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,177

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218210

Int. Cl.³ F02M *23/04*

U.S. Cl. 123—585 **7 Claims**



1. A device for the control of at least one throttle diameter in a control line, especially in a line carrying fuel for an internal combustion engine, having at least one circle segment-like control section in a control bore intersecting the control line, the control section being pivotable around an axle and controlling to a larger or lesser degree the throttle diameter formed by the intersection of the control line and control bore, wherein the control bore (**36**) comprises a circularly arched sealing surface (**40**) surrounding the throttle diameter (**39**), the circle segment-like control section (**37**) and the arched sealing surface (**40**) both having a radius extending eccentrically to the axle (**21**), whereby the radial distance(s) between the circumference of the control section (**37**) and the circumference of the sealing surface (**40**) is a finite distance when the control section (**37**) is in a position opening the throttle diameter (**39**), and approaches zero when the control section (**37**) is in a position closing the throttle diameter (**39**).

7. A method for controlling the flow of a fluid through a throttle diameter surrounded by a circularly arched sealing surface in a control line for carrying fuel in an internal combustion engine having a control section in a control bore intersecting the control line and controlling to a larger or lesser degree the throttle diameter formed by the intersection of the control line and the control bore, comprising the step of, passing the control section over the sealing surface through an arc that converges with the arc defining the sealing surface, whereby the distance between the surface of the control section and the sealing surface approaches zero when the control section is in a position closing the throttle diameter.

4,428,357

SELF-VENTILATED RANGE AND METHOD OF INSTALLING

Thomas R. Field, Noblesville, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.

Filed Oct. 13, 1981, Ser. No. 310,552

Int. Cl.³ F24C *15/20*

U.S. Cl. 126—299 R **5 Claims**

1. A self-ventilated range comprising:

a blower means adapted to be secured to a floor and having an inlet and an outlet which is adapted to be connected to an atmospheric exhaust;

a bracket means associated with said blower means for selectively securing said blower means to said floor in one of a first mode with said blower means outlet directed for

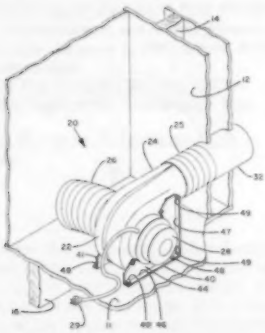
discharge through-the-wall and a second mode with said outlet directed for discharge through-the-floor to said atmospheric exhaust;

a cabinet means having a top surface and defining a ventilation cavity which is open at the back and bottom whereby said cabinet means is adapted to be set in place over said blower means when said blower means is secured to a floor so that said blower means is located in said ventilation cavity;

an oven means located in said cabinet means;

at least one cooking unit adapted to be located in said top surface of said cabinet means;

a proximity ventilation inlet grill located in said top surface of said cabinet means adjacent said cooking unit;



a plenum means located in said cabinet means and extending essentially the full height of said cabinet means and providing a fluid path from said inlet grill to a plenum outlet which leads to said ventilation cavity;

access door means forming the front of said ventilation cavity and being adapted to open to provide access to said ventilation cavity;

fluid connecting means for connecting said inlet of said blower means to said plenum outlet when said cabinet means is set in place over said blower means and said access door means is open to establish a proximity ventilation flow path which serially includes said inlet grill, said plenum means, said fluid connecting means and said blower means for discharge to said atmospheric exhaust.

4,428,358

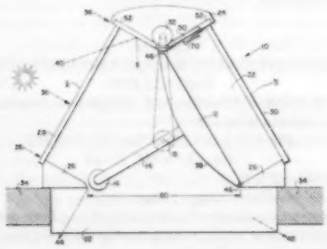
SOLAR SKYLIGHT

James C. Adamson, Osprey La., Rumson, N.J. 07760

Filed Dec. 28, 1981, Ser. No. 335,062

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—417 **8 Claims**



1. A skylight apparatus comprising:

a housing means having at least three faces including a northern face, a southern face and a downward face, said housing means also including a long central axis substantially parallel to the planes of said three faces;

a three position shutter means for reflecting sun from said northern face to said downward face during a winter day and for reflecting the summer sun back through said southern face during a summer day and for blocking off said downward face during the winter night, said shutter means including at least two faces;

pivot means attached to said housing for carrying said shutter means in such a manner that said shutter means can rotate about a single axis parallel to the long central axis of said housing means; and,

counterweight means attached to said shutter means,

wherein said counterweight means and said shutter means are substantially balanced so that said shutter means can rotate about said single axis parallel to the long central axis of said housing means in a substantially effortless manner.

4,428,359

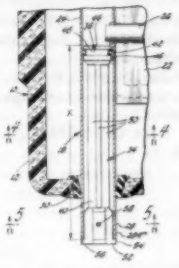
DETACHABLE INSERT FOR SOLAR ABSORBER

Louis Scarselletta, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1982, Ser. No. 345,930

Int. Cl.³ F24J *3/02;* **D03C** *13/00;* **F16F** *1/34*

U.S. Cl. 126—418 **1 Claim**



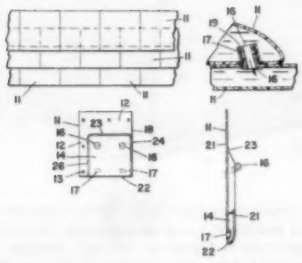
1. An insert device adapted for use with a solar absorber having longitudinal passages interconnecting a pair of flow-through headers when the solar absorber is mounted with the headers vertical and the longitudinal passages horizontal and one of the headers has an unused leg at its lower end that extends a substantial distance below the lowermost longitudinal passage, said insert device adapted for insertion in the unused leg and comprising a plug body having an inner end portion adapted to form a plug in the unused leg and an outer end adapted to engage and stop the plug body against the end of the unused leg, seal means mounted on and extending about said inner plug end portion for providing sealing between the latter and the interior of the unused leg and an elongated middle portion interconnecting said inner end portion and said outer end, said plug body having a length measured from said inner plug end portion along said middle portion to said stop corresponding to the length of the unused leg measured from its end to the lowermost horizontal longitudinal passage so that said inner plug end portion and seal means are located to plug off and seal the unused leg just below the lowermost horizontal longitudinal passage whereby fluid stagnation is prevented from occurring in the unused leg, said plug body further including weepage passage means extending from said inner plug end portion and along said middle portion and past said outer end for providing detection of leakage past said seal means, and securing means for securing said plug body in its stopped location in the unused leg.

4,428,360

ROOFING SYSTEM FOR SOLAR HEAT COLLECTION AND METHOD FOR FABRICATION THEREOF

Howard S. Cohea, 2001 Lincoln St., Berkeley, Calif.

Division of Ser. No. 801,511, May 31, 1977, abandoned. This application Jan. 4, 1982, Ser. No. 336,779
Int. Cl.³ F24J 3/02
U.S. Cl. 126—432 4 Claims



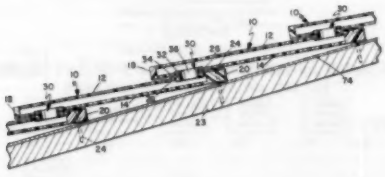
1. A method for forming a roofing system for collecting and utilizing solar heat, using a plurality of water-proof shingle members secured to a roof deck; comprising the steps of forming a generally rectangular web of a water-proof, pliable material, securing a first fluid coupling member extending through a first portion of said web, securing a second fluid coupling member extending through a second portion of said web, folding said web at a fold line to dispose said first and second portions in overlying, adjacent relationship, forming a seam joining said first and second portions to define with said fold line a sealed chamber; arranging said shingle members in overlapping shingle matrix fashion, engaging said first and second coupling members of overlapping adjacent shingle members to connect said chambers in a fluid conducting fashion, and circulating a heat absorbing fluid through said connected chambers.

4,428,361

SOLAR HEATING SHINGLE ROOF STRUCTURE

George T. Straza, 1071 Industrial Pl., El Cajon, Calif. 92020

Filed Jun. 11, 1976, Ser. No. 694,959
Int. Cl.³ F24J 3/02
U.S. Cl. 126—432 16 Claims



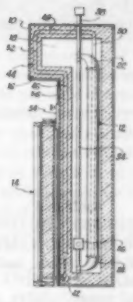
1. A solar heating shingle roof structure, comprising,
a plurality of laterally extending longitudinally overlapping rows of interconnected, fluid conducting shingles having means for attachment to a roof structure,
each shingle comprising a hollow body of substantially rectangular, thin, flat configuration, having an upper surface, a lower surface, a front longitudinal edge and a rear longitudinal edge,
each shingle having at least one fluid inlet adjacent the rear edge for communicating with the outlet of an overlapping shingle and at least one fluid outlet adjacent the front edge thereof for communicating with the inlet of an overlapped shingle,
and means for interconnecting the inlets and outlets of adjacent overlapping shingles.

4,428,362

SOLAR HEATING SYSTEM

William J. Larkin, 12698 Morgan La., Garden Grove, Calif. 92684

Filed Jan. 12, 1981, Ser. No. 224,141
Int. Cl.³ F24J 3/02
U.S. Cl. 126—434 6 Claims



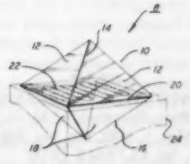
1. An anti-reverse-siphon solar collector system comprising:
(a) a hot water storage tank;
(b) a flat plate collector communicating at the top with an upper portion of said tank and being disposed at substantially the same heights as said tank;
(c) a cold water supply line having a delivery end connected to the bottom of said collector and a source end communicating with a water source;
(d) said supply line including an upright loop with substantial vertical components including ascending and descending standpipe portions wherein in normal solar operation the ascending portion is upstream from, and ushers water into, said descending portion; and
(e) said descending standpipe portion having its highest point on the order of a foot higher than the top of said collector and being thermally insulated from said tank and said collector, and said ascending portion descending from its juncture with said descending portion down into said tank from the top extending into communication with a lower portion thereof, causing a temperature differential in said standpipe portions such that said ascending portion is maintained warmer than said descending portion causing an anti-backflow pressure head to develop to counter creeping backflow in said system due to cooling of said collector.

4,428,363

ENVIRONMENTAL HEATING SYSTEM

Raymond W. Komula, 332 Park St., Jamestown, N.Y. 14701

Filed Dec. 19, 1977, Ser. No. 861,701
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 8 Claims



1. A solar energy collection system, comprising:
a heat collecting element mounted in a generally horizontal plane between a transparent cover and a reflective base to

collect maximum radiated solar energy passing through said transparent and reflected by said reflective base;

said transparent cover comprising a plurality of flat transparent panels joined at the edges thereof and at the top forming a multi-sided pyramid extending upwardly from said heat collecting element; and wherein said reflective base comprises a plurality of flat mirror-surfaced panels joined together at the edges thereof to form an inverted pyramid to reflect radiant energy to said heat collecting element.

4,428,364

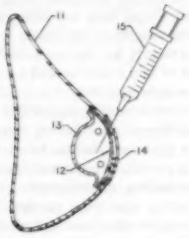
SELF-SEALING INJECTION BUTTON AND METHOD OF MAKING SAME

Anthony J. Bartolo, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 28,946, Apr. 11, 1979, abandoned. This application Jul. 16, 1982, Ser. No. 399,071

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **9 Claims**



1. A self-sealing injection button adapted to be pierced by a hypodermic needle, said injection button comprising a unitary body of cured silicone rubber swollen with a swelling agent which is nonvolatile under atmospheric conditions, and a restraining means for preventing the swollen silicone rubber from occupying the volume it would ordinarily occupy in the absence of the restraining means to provide and maintain compressive forces within the silicone rubber for sealing punctures, said restraining means comprising multiple parallel layers of fabric oriented in more than one weave direction, said layers being impregnated with and in intimate contact with the silicone rubber.

4,428,365

ANTI-INCONTINENT PROSTHESES

Said I. Hakky, Sardoon, Batween A² 15/14/1, Baghdad, Iraq

Filed Mar. 1, 1982, Ser. No. 353,719

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **16 Claims**

1. A prosthesis for controlling urinary incontinence comprising support means including a portion in the form of at least one turn of a spiral, said portion including a wall of generally non-stretchable construction and arranged for disposition about the corpus spongiosum and urethra, plural inflatable chambers located at spaced locations along said portion and

means for inflating said chambers with a fluid to constrict said urethra.

4,428,366

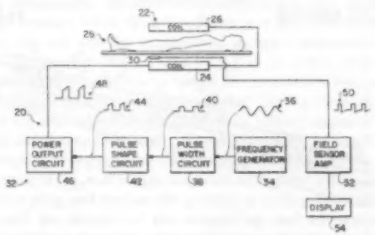
ELECTROMAGNETIC APPARATUS AND METHOD FOR THE REDUCTION OF SERUM GLUCOSE LEVELS

Eugene Findl, Amityville, and Peter O. Milch, Coram, both of N.Y., assignors to Alfred B. Kurtz, Wynnewood, Pa. and Robert J. Kurtz, New York, N.Y.

Filed May 6, 1981, Ser. No. 261,257

Int. Cl.³ A61B *17/52*

U.S. Cl. 128—15 **8 Claims**



1. A method of alleviating hyperglycemia in a living animal afflicted with same, the method comprising:

placing at least a portion of the animal in the field of an electromagnet: and

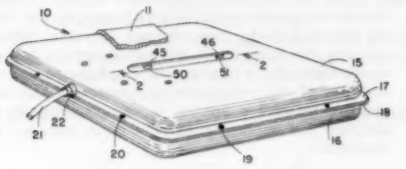
subjecting at least the portion of the animal to a pulsating magnetic field generated by said electromagnet by providing said electromagnet with an intermittent electric power supply having the following characteristics:

a pulse train of pulses having a pulse repetition rate of about 15 hertz plus or minus 0.5 hertz, a pulse width of about 350 microseconds and a pulse amplitude of about 60 millivolts to cause a decrease in the serum glucose level of the animal.

4,428,367
VIBRATORY ELECTRIC MOTOR AND APPLIANCE EMBODYING SAME

Gregory S. Wahl, and Raymond H. Babel, both of Sterling, Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.

Filed Oct. 8, 1982, Ser. No. 433,456
Int. Cl.³ A61H *23/02*
U.S. Cl. 128—24.2 **2 Claims**



1. In a vibratory electric motor and an appliance embodying same wherein the appliance has a pair of shallow pan members reversely secured together by means of peripheral portions thereof, the pan members having spaced and aligned generally parallel portions within the peripheral portions and wherein the vibratory electric motor has a core-coil assembly with spaced pole faces and a generally C-shaped armature having spaced legs and a resilient web connecting corresponding ends of the legs, a first armature leg being connected to a core portion opposite the pole faces and the second armature leg being spaced by a gap from the pole faces, the combination thereof with a means for mounting the vibratory electric motor firmly within the pan members, said mounting means comprising:

a pair of spaced apertures in the generally parallel portions of the pan members, the apertures in one pan member being generally opposite the apertures in the other pan member;

the second armature leg being sized in width to exceed the width dimension of the core-coil assembly, the sides of said second armature leg which define the armature width being disposed adjacent the generally parallel portions of the pan members and the apertures therein, and

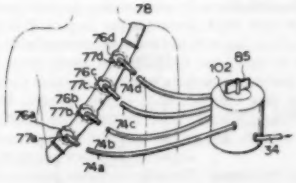
a pair of projections on each said side of the second armature leg adapted to enter adjacent apertures and thus mount the motor firmly within the pan members,

whereby mounting parts and assembly time are minimized, and the second armature leg serves to strengthen the pan members.

4,428,368
MASSAGE DEVICE

Masakatsu Torii, 40-9, Kamiya 2-chome, Kita-ku, Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 192,101
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—38 **7 Claims**

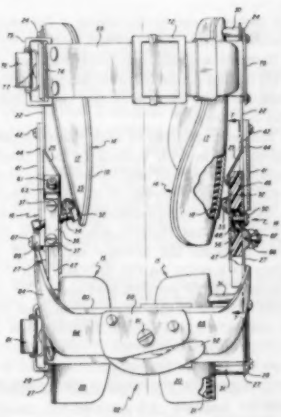


1. A massage device comprising: a housing, an electric motor, a reduction gear and a crank all connected in series for rotation in unison, a pump connected to the crank and operable to move air, a delivery tube for conveying air moved by said pump to the exterior of the housing, a hose having one end detachably connected to said delivery tube, a rotary valve assembly connected to said hose in fluid communication therewith, a plurality of branch hoses connected with said valve assembly, drive means including a spring motor operative independently of said electric motor for driving said rotary valve assembly, control means rotatable to a maximum of one revolution to initiate said spring motor and being movable to a selected position to determine the period of time of rotation of said rotary valve assembly, said valve assembly being continuously rotatable during said selected period of time to deliver fluid sequentially to said plurality of branch hoses simultaneously with the movement of air by said pump, a plurality of cups connected to said plurality of branch hoses, respectively, and band means attachable to the body of a person and having notched portions for detachably receiving and holding said cups in selected spaced relationship relative to each other and for locating said cups in a plurality of spaced locations on the body to sequentially apply stimulation to such locations for the predetermined period of time.

4,428,369
CORRECTIVE AND PROTECTIVE KNEE BRACE

Arthur C. Peckham, 1308 Sunset Ridge, Watertown, N.Y. 13601; Rolf A. Faste, Syracuse, and Arthur C. Peckham, Jr., Watertown, all of N.Y., assignors to Arthur C. Peckham, Watertown, N.Y.

Continuation-in-part of Ser. No. 124,474, Feb. 25, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 284,674
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **5 Claims**

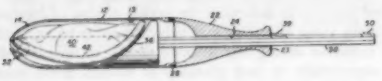


1. A corrective and protective brace for a human joint, the brace encircling the joint when worn and comprising a pair of upper and a pair of lower pressure pads for respectively engaging the wearer's limbs above and below the joint, means connecting the upper and lower pads together for relative movement therebetween, the connecting means including coacting roller and inclined plane means arranged to permit both rotational and translational movement between the upper and lower pads, the connecting means further including a pair of flexible cables each of which engages the roller means, one end of each cable being operably connected to an upper pressure pad and the other end of each cable being operably connected to a lower pressure pad, and toggle means connected to the pad connecting means and operable to cause the upper and lower pads to exert pressure on the wearer's limbs above and below the joint, the toggle means including a pair of coacting toggle arms that together extend approximately half way around the joint.

4,428,370
INSERTION UNIT FOR A VAGINAL DIAPHRAGM

Patricia G. Keely, 15500 Chispa Rd., Atascadero, Calif. 93422

Filed Feb. 8, 1982, Ser. No. 346,514
Int. Cl.³ A61F 5/46
U.S. Cl. 128—127 5 Claims



1. An insertion unit for a vaginal diaphragm having a stiff resilient rim therearound, said diaphragm having a forward portion, a rearward portion and side portions when folded lengthwise, said insertion unit comprising:

a hollow tubular member having a forward end and a rearward end;

a plurality of substantially triangular flexible segments integral at their respective bases with the forward end of said tubular member and having their respective apexes converging forwardly to a point and having adjacent sides in substantially touching contact to close the forward end of said tubular member and, upon being flexed outwardly, to define an opening having a diameter substantially equal to the internal diameter of said tubular member;

a movable piston member slidably mounted within said tubular member for holding said diaphragm in a lengthwise folded position and to expel said diaphragm from the forward end of said tubular member through said segments,

(a) said piston member including a forward portion, a rearward portion, and a center portion for connecting said forward and said rearward portions, said forward portion of said piston member having means for engaging the forward portion of the rim of the lengthwise folded diaphragm,

(b) the rearward portion of said piston member slidingly engaging the interior surface of said tubular member and defining a curved seat for engaging and supporting the rear portion of the rim of the diaphragm said curved seat extending longitudinally and circumferentially along said piston from a point where the rearward portion engages the interior surface of said tubular member to a point on the opposite side of said piston within said center portion, said means for engaging the forward portion of said rim being aligned with said seat such that when said folded diaphragm is mounted on said piston, the side portions of said diaphragm overlaps said piston with the forward portion held by said engaging means and the rearward portion supported by said seat; and

a handle mounted on the rearward portion of said piston member and extending beyond said tubular member for moving said piston member through said flexible segments to expel the diaphragm.

4,428,371
INTRAUTERINE CONTRACEPTIVE LOADING DEVICE AND METHOD

Melvin L. Krzeminski, Palatine, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 16, 1981, Ser. No. 321,995
Int. Cl.³ A61F 5/46
U.S. Cl. 128—130 8 Claims

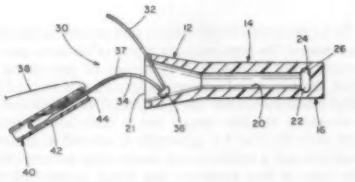
1. An intrauterine contraceptive loading apparatus, comprising:

an intrauterine contraceptive device having a longitudinal stem section and a flexible arm depending from one end of the stem section, and an enlarged head at said one end of the stem section,

a generally tubular inserter barrel, and

a loading instrument comprising an elongated column having first and second ends and a longitudinal axis, said column comprising a tubular section that defines an aperture extending axially therethrough from said first end, said column having a closed end section at the second end thereof, said aperture being dimensionally adapted to receive said intrauterine contraceptive device and said inserter barrel,

said closed end section of said column having a chamber therein that communicates with said aperture, said chamber having a greater cross-sectional dimension than said aperture, the interface of said tubular section and said aperture defining a shoulder surrounding said aperture, said head of said intrauterine contraceptive device being movable between a position in engagement with said shoulder and another position without engaging said shoulder,

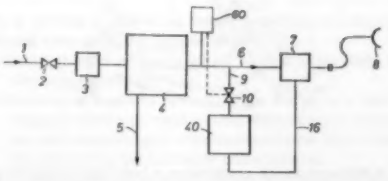


said closed end section having a rear wall that comprises stop means to limit insertion of said intrauterine contraceptive device and barrel into said instrument, whereby the longitudinal stem section of the intrauterine device is partially received inside the barrel of the inserter with the flexible arm outside said barrel and then displaced into the tubular section of the loading instrument until the head is received in the chamber, said head being engageable with the shoulder to retain said device in said instrument, said barrel being withdrawn until the barrel is past the end of said arm, said barrel being displaced back into said tubular section with both said stem and said arm within said barrel until said barrel is proximate said head, said device being removable from the instrument by said barrel moving said head out of engagement with said shoulder so that said barrel can be withdrawn together with said device.

4,428,372
PROCESS AND APPARATUS FOR PROVIDING BREATHING GAS

Gerhard Beysel, and Rudiger von Saldern, both of Wolfratshausen, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 289,009
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029080
Int. Cl.³ A62B 7/00; B01D 53/04
U.S. Cl. 128—202.26 20 Claims



1. In a process for providing breathing gas for occupants of pressurized cabins in aircraft wherein said breathing gas is

normally provided by passing air through adsorbers in aircraft for increasing the oxygen concentration of the air, the improvement comprising:

withdrawing a portion of the oxygen-enriched breathing gas from said adsorbers and storing said portion of oxygen enriched breathing gas as an emergency supply of breathing gas for consumption only in the event of an interruption of the normal breathing gas supply.

4,428,373

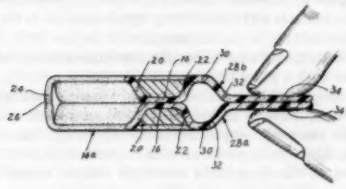
DISPOSABLE DENTAL TRAY

Paul Seid, New City, and Herbert Wolf, Pomona, both of N.Y., assignors to Sultan Dental Products Limited, Englewood, N.J.

Filed Feb. 3, 1982, Ser. No. 345,539

Int. Cl.³ A61M *35/00*

U.S. Cl. 604—77 **5 Claims**



1. In a disposable dental tray for topical application of dental medications to the teeth including a unitary member formed of a flexible foam material defining a pair of U-shaped tray portions connected to each other by hinge means and configured to fit over the upper and lower teeth of the mouth respectively when the tray portions are folded around the hinge means, and a tab extending outwardly from each of said tray portions, the improvement comprising:

said tabs include respective tab sections which are preformed so as to be situated such that when the tray portions are folded, the respective tab sections will contiguously mutually confront each other in the absence of any external forces being applied thereto and be squeezable against each other without the consequent application of any substantial forces on said tray portions which would distort the same, said tabs thereby constituting tray portion positioning tabs.

4,428,374

UMBILICAL CORD CLAMPING ASSEMBLY

Robert M. Auburn, 2683 Surfrider Ave., Ventura, Calif. 93003

Continuation-in-part of Ser. No. 973,006, Dec. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 777,358, Mar. 14, 1977, abandoned. This application Jul. 11, 1980, Ser. No. 168,656

Int. Cl.³ A61B *17/12, 17/32*

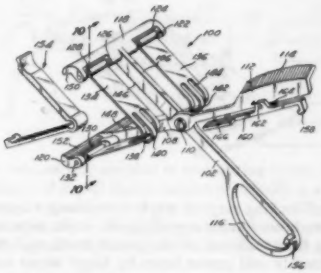
U.S. Cl. 128—318 **3 Claims**

1. In combination with a first clamp having a first set of arms connected together in a generally V-shaped arrangement and a second clamp having a second set of arms connected together in a general V-shaped arrangement, both said sets of arms being movable between an open position and a closed position, with said arms about an umbilical cord and in said closed position there being a fastening assembly attached to the free end of said arms to tightly lock together said arms in said closed position, an umbilical cord clamping tool to simultaneously lock together said first and second clamps, said umbilical cord clamping tool comprising:

a pair of cutting members pivotally connected together in a scissor-like manner, each of said cutting members including a cutting blade, said cutting blades being adapted to cooperate together to facilitate cutting of an umbilical cord;

the outermost end of one of said cutting members being fixedly attached to a first transverse member with the outermost end of the other of said cutting members being fixedly attached to a second transverse member;

a first substantially V-shaped spring member terminating in a pair of first ends, one of said first ends being pivotally attached to said first transverse member, the other said first end being pivotally attached to said second transverse member, a second substantially V-shaped spring member terminating in a pair of second ends, one of said second ends being pivotally attached to said first transverse member, the other said second end being pivotally attached to said second transverse member, said first V-shaped spring member being located on one side of said pair of cutting members with the other said V-shaped spring member being located on the other side of said cutting members, said first and second V-shaped spring members exert a continuous bias on said pair of cutting members to locate



such in an open position to receive said first and second clamps in their said open position;

said first clamp to be cradled within said first V-shaped spring member with said second clamp to be cradled within said second V-shaped spring member, both said first V-shaped spring member and said second V-shaped member being capable of bowing outwardly during the scissors movement of said cutting members to a closed position resulting in locking together of said first clamp and said second clamp and locate such in their said closed position, said bowing outwardly to accommodate the inherent enlargement of said first and second clamps about the umbilical cord; and

means for seating and laterally restraining both said first clamp and said second clamp within its respective said V-shaped spring member.

4,428,375

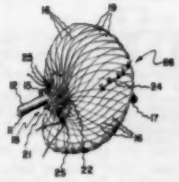
SURGICAL BAG FOR SPLENORRHAPHY

Barry R. Ellman, 254 Stratton Rd., Rutland, Vt. 05701

Filed Feb. 16, 1982, Ser. No. 348,976

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—334 R **5 Claims**



1. A surgical bag for enclosing an organ during surgical repair, comprising a generally tubular flexible bag having one end closed and the opposite end open, said bag having an open net construction and being made of mesh type material con-

structed of patient tolerable or absorbable threads and sized to allow the organ to be placed within the bag through its open end, and plural drawstrings of patient tolerable or absorbable material strung through the net adjacent and spaced at different distances from the bag open end and capable when pulled to conform the bag tightly around the organ in such manner as to close any fractures therein.

4,428,376

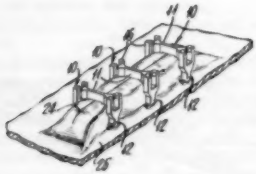
PLASTIC SURGICAL STAPLE

Robert W. Mericle, Bridgewater, N.J., assignor to Ethicon Inc., Somerville, N.J.

Continuation of Ser. No. 146,943, May 2, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,567

Int. Cl.³ A61B *17/08, 17/04*

U.S. Cl. 128—335 **25 Claims**



1. A self-locking surgical staple comprising a center beam, said center beam having opposing side walls, two staple legs extending from each end of said center beam, said staple legs being joined to said center beam by hinge means adapted to permit said staple legs to rotate relative to said center beam, said staple legs terminating in tissue-piercing segments which assume substantially end-to-end alignment when said staple legs are rotated relative to said center beam, and cam means cooperatively disposed on said side walls of said center beam, said cam means being for locking legs adapted to lock said staple legs in position with said tissue-piercing segments in substantially end-to-end alignment when said staple legs are so rotated.

4,428,377

METHOD FOR THE ELECTRICAL STIMULATION OF THE AUDITORY NERVE AND MULTICHANNEL HEARING PROSTHESIS FOR CARRYING OUT THE METHOD

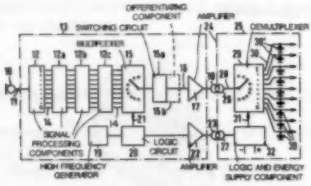
Manfred Zollner; Christian Hoffmann, both of Munich, and Eberhard Zwicker, Icking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,129

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008677

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 R **4 Claims**



1. A hearing prosthesis for the electric stimulation of the auditory nerve, comprising

(a) an implantable receiver means having multiple electrode output means for the supply of electric stimulation to the auditory nerve and having receiving coil means for receiving transmitted stimulation signals,

(b) wireless transcutaneous signal transmission means for transmitting stimulation signals to the receiving coil means via an inductive coupling with the receiving coil means of said implantable receiver means for effecting the electric stimulation of the auditory nerve via the multiple electrode output means of the implantable receiver means,

(c) a signal processing installation including means for receiving an acoustic signal and having a plurality of low frequency output channels for supplying respective frequency bands of the acoustic signal,

(d) said signal processing installation having high frequency generator means for controlling the sampling of the respective output channels,

(e) said signal processing installation having pulse amplitude modulated transmission means controlled by said high frequency generator means and coupled with said low frequency output channels and with said wireless transcutaneous signal transmission means for sequentially sampling the output channels and transmitting signal samples to the wireless transcutaneous signal transmission means from the respective output channels in pulse amplitude modulated fashion and with a pulse envelope of alternating polarity, and

(f) said implantable receiver means having demultiplexer means coupled with said receiving coil means and with said multiple electrode output means for supplying electric stimulation signals in accordance with respective received signal samples to the respective electrode output means in sequence.

4,428,378

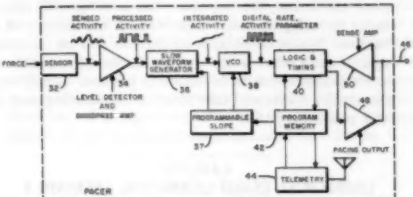
RATE ADAPTIVE PACER

Kenneth M. Anderson, Bloomington, and Dennis A. Brumwell, New Brighton, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 19, 1981, Ser. No. 322,815

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **8 Claims**



1. An implantable pacer for the therapeutic stimulation of a patient's heart including a rate variable stimulating system for pacing the heart coupled to a rate determining system for setting the stimulating rate in response to a rate signal dependent on a measured physiologic variable of the patient wherein the improved rate determining system comprises:

a force transducing sensor producing a raw signal,

a signal processing means coupled to said force transducing sensor for extracting a rate signal corresponding to the frequency of the highest amplitude component of the bandpassed spectra of said raw signal for generating said rate signal.

4,428,379

PASSIVE ULTRASOUND NEEDLE PROBE LOCATOR

C. Wayne Robbins, Lawrenceville, and William S. N. Trimmer, Belle Mead, both of N.J., assignors to Technicare Corporation, Solon, Ohio

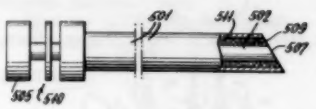
Filed Jan. 7, 1982, Ser. No. 337,872

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **3 Claims**

1. In an ultrasound needle tip locator system employing an

imaging transducer external to the body, hollow needle means for insertion into the body, and conduit means carried within said needle means for detecting sonic energy at the needle means tip and for conveying sonic energy through the needle means and outside the body, and means for acoustic insulation of said conduit means from the inner surface of said needle

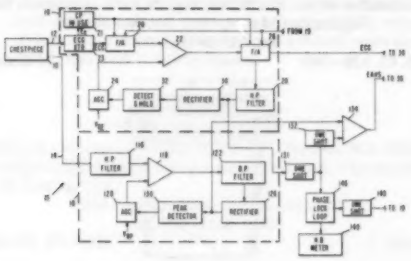


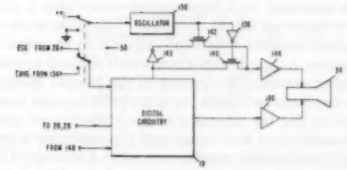
means, the improvement wherein said means for insulation comprises a packing of microspheres in the void between said conduit means and the inner surface of said needle means.

4,428,380
METHOD AND IMPROVED APPARATUS FOR ANALYZING ACTIVITY

Shi-Yin Wong, Santa Monica; Michael J. Little, Tarzana; J. David Margerum, Woodland Hills; Thomas A. Nussmeier, Thousand Oaks; Theodore Calderone, Thousand Oaks, and Harry A. Dellamano, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 11, 1980, Ser. No. 186,041
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—715 **16 Claims**





1. A method for producing a visual representation of the activity of a heart comprising the steps of:

(a) generating a first analog electrical signal and a second analog electrical signal, said first signal representing the electrocardiogram (ECG) of the heart and said second signal representing the heart sounds;

(b) deriving an annotation signal from said first signal, said annotation signal representing the location of the QRS complex of said ECG;

(c) rectifying said second signal;

(d) combining said annotation signal with said rectified second signal to produce an annotated recitifed heart sound signal;

(e) utilizing said annotated rectified signal to produce a symmetrical annotated rectified signal; and

(f) displaying at least said symmetrical annotated rectified signal so that the heart's audio characteristics may be observed.

4,428,381
MONITORING DEVICE

Dennis G. Hepp, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

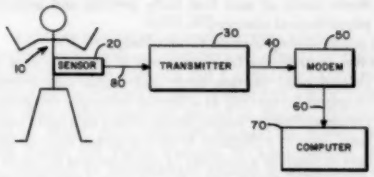
Filed Mar. 13, 1981, Ser. No. 243,225
Int. Cl.³ A61B *7/00*
U.S. Cl. 128—715 **7 Claims**

1. Apparatus for transtelephonic monitoring of acoustic clicks of a prosthetic heart valve comprising:

a sensor means for sensing said acoustic clicks at a first rate and for converting said sensed acoustic clicks to an input signal;

means responsively coupled to said sensor means for converting said input signal to a digital signal;

means responsively coupled to said converting means for storing said digital signal;



means responsively coupled to said storing means for transmitting said digital signal transtelephonically at a different second rate; and

means responsively coupled to said transmitting means for receiving said digital signal transtelephonically.

4,428,382
METHOD FOR IDENTIFYING THE PRESENCE OF ABNORMAL TISSUE

E. Peter T. Walsall, and James R. Vincent, both of Cardiff by the Sea, Calif., assignors to GST Laboratories, Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 183,966, Sep. 3, 1980. This application Jan. 27, 1982, Ser. No. 343,389
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—736 **20 Claims**

1. An objective quantitative method for identifying tissue suspected of being abnormal in at least a first portion of the body of a living organism, the method comprising the steps of:

(a) providing means for storing data;

(b) measuring the static temperature of at least one area of a second portion of said body by thermally responsive measurement means and storing the same in said storage means, said second portion body temperature being responsive to general temperature changes in said body and serving as a first reference temperature;

(c) dividing said first body portion into a plurality of imaginary radial sectors extending from a central sector;

(d) measuring the static temperatures of said first body portion at least once at a plurality of points within each of said sectors to provide a plurality of temperatures for each

sector relative to said first reference temperature thereby producing a static scan over each sector of said first body portion, said measurement being taken with said measurement means;

(e) determining a first average static temperature for each sector from the plurality of sector temperatures;

(f) storing the plurality of average static sector temperatures and the sectors of said first body portion to which they relate in said storage means;

(g) storing an average static temperature for said first body portion determined from said plurality of average static sector temperatures in said storage means;

(h) correlating said first average static sector temperatures to a corresponding set of expected static sector temperatures pre-stored in said storage means, wherein said expected static sector temperatures are prior temperature measurements made of said first body portion and adjusted for physiological changes;

(i) administering a stress to said body;

(j) remeasuring the temperature of at least one area of said second body portion after said stress, said remeasured temperature serving as a second reference temperature;

(k) remeasuring the temperatures of said first body portion at least once at a plurality of points within each of said sectors to provide a plurality of temperatures for each sector during said stress relative to said second reference temperature, said remeasurement being taken with thereby producing a stress scan over each sector of said first body portion, said measurement means;

(l) determining a second average temperature for each sector from the plurality of temperatures measured during the stress scan;

(m) storing the plurality of second average sector temperatures from said stress scan and the sectors of said first body portion to which they relate in said storage means;

(n) storing an average temperature for said first body portion determined from said plurality of second average sector temperatures measured during said stress scan and stored in said storage means;

(o) correlating said plurality of second average sector temperatures from said stress scan to a corresponding set of said expected static sector temperatures pre-stored in said storage means, wherein said expected static sector temperatures are prior temperature measurements made of said first body portion adjusted for physiological changes;

(p) providing means for selectively displaying objective data;

(q) selectively providing as output on said display means said first average static sector temperatures and said first reference temperature and said second average sector temperatures and said second reference temperature to provide a temperature topological profile of said first body portion;

(r) determining from said temperature topological profile the probability that any of said sectors in said first body portion contains abnormal tissue.

4,428,383

MANIFOLD FOR MONITORING HEMODYNAMIC PRESSURE

William A. DeVroom, Glendora, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 13, 1981, Ser. No. 310,016

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—748 **16 Claims**

1. A manifold assembly for monitoring hemodynamic pressures comprising:

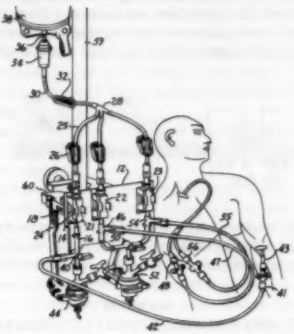
a base;

first and second flush valves mounted on the base;

a first T-connector in fluid flow communication with the first flush valve;

a second T-connector in fluid flow communication with the second flush valve;

a three port stopcock mounted on the base and having one of its ports in fluid flow communication with the first T-connector and one of its ports in fluid flow communication with the second T-connector.



4,428,384

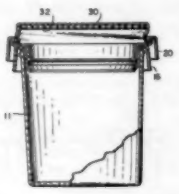
METHOD AND APPARATUS FOR COLLECTING URINE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Continuation of Ser. No. 70,743, Aug. 29, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,707

Int. Cl.³ B01L *3/00*

U.S. Cl. 128—760 **14 Claims**



11. A specimen collecting device comprising a container having an open end for the collection of a specimen, an annular intermediate member removably secured to the open end of the container, a cap protector removably secured to said annular member to close the opening of the annular member and thereby the container, and a cap removably secured to said cap protector so that the internal surfaces of the cap are protected from contamination both when said cap protector is removed from said intermediate member and when it is secured thereto, said open end of said container being formed by a rim, said intermediate member being channular in cross-sectional shape to form an annular channel in which said rim of said container is removably received and secured, said cap protector having a portion which extends over said opening of said intermediate member to close said opening and then into a depending peripheral annular rim, said portion of said cap protector over said opening having a central recess extending downwardly to form with said rim of said cap protector an annular channel in which is removably received and secured said channular shaped intermediate member, said recess having an enlarged upper portion forming a pocket for removably receiving said cap, said cap having a top portion and a peripheral rim depending from said top portion, said rim of said cap being removably received and secured in the enlarged upper portion of said recess so that the inner surfaces of said cap form with the surfaces of said recess a closed chamber, said cap being of a size to fit over the opening and rim of said container after removal of said cap protector from said intermediate member and said

intermediate member from said container and after said cap is removed from said pocket in said cap protector.

4,428,385

DEVICE FOR MEASURING MALE POTENCY

Alvaro Morales, Kingston, Canada, assignor to Queen's University of Kingston, Kingston, Canada

Filed Apr. 1, 1982, Ser. No. 364,485
Claims priority, application Canada, Oct. 30, 1981, 389093
Int. Cl.³ A61B 5/10
U.S. Cl. 128—774 **8 Claims**

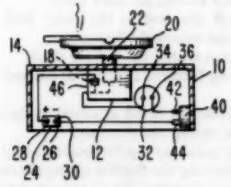
1. A device for monitoring penile expansion comprising:
an elongated thin walled tubular member having first and second ends and made from a soft and flexible but inelastic material, and including hole means in the wall adjacent said first end thereof;
a soft and flexible but inelastic tail member extending longitudinally from said first end of said tubular member and terminating with a draw pull means;
said tail member being insertable axially into said tubular member at said second end with said draw pull means projecting outwardly through said hole means thereby arranging a substantial portion of said tail within said tubular member for sliding movement relative thereto so as to provide a closed loop which is freely radially expansible in response to erectile activity of a flaccid penis about which said loop is tightly drawn.

4,428,386

SAFETY ASHTRAY

Joseph R. Alloway, 11 Great Woods Dr., Trenton, N.J. 08618, assignor to Joseph R. Alloway and Dominick A. Vizzoni, both of Trenton, N.J.

Filed Aug. 25, 1982, Ser. No. 411,143
Int. Cl.³ A24F 19/00
U.S. Cl. 131—231 **7 Claims**



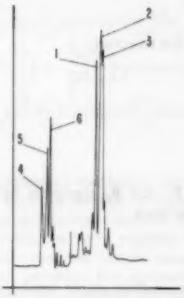
1. A safety ashtray device comprising:
(a) a housing;
(b) a switch mounted in the upper surface of said housing, such switch being movable from an opened contacts position to a closed contacts position and vice versa;
(c) an ashtray connected with respect to said switch and being responsive to downward pressure being exerted thereon to urge said switch to the opened contacts position;
(d) a power source mounted within said housing means and including a first terminal and a second terminal, said first terminal being electrically connected to one side of the contacts of said switch;
(e) a timer mounted within said housing and including a first connection and a second connection normally in electrical communication with respect to one another, said first connection being electrically connected to the other side of the contacts of said power source, said timer including an actuator responsive to activation thereof to temporarily interrupt electrical communication between said first connection and said second connection for a predetermined time period; and
(f) an indicator operable between an on mode and an off mode and defining an A connection and a B connection thereon, said indicator responsive to electrical signal being passed between said A connection and said B connection to be in the on mode and provide indication of a dangerous condition, said A connection being in electrical communication with respect to said second connection and said B connection being in electrical communication with respect to said second terminal of said power source.

4,428,387

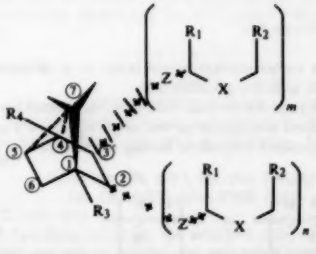
USE OF METHYL SUBSTITUTED PINYL OXOPENTENES, FOR AUGMENTING, ENHANCING OF MODIFYING THE AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLES

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Monmouth Beach, and Takao Yoshida, W. Long Branch, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,237
Int. Cl.³ A24B 3/12
U.S. Cl. 131—276 **5 Claims**



1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobaccos and smoking tobacco articles comprising the step of adding to said consumable material, an aroma or taste augmenting, enhancing or modifying quantity of at least one compound defined according to the structure:



wherein Z represents methylidene defined according to the structure:

ethylidene defined according to the structure:

or ethylenyl defined according to the structure:

wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents no bond; wherein n is 0 or 1, and m is 0 or 1 with the sum of n+m being equal to 1;
wherein X represents carbinol having the structure:

or ketone having the structure:

wherein R_1, R_2, R_3 and R_4 represent hydrogen or methyl; wherein one of the lines:

++++

represents a carbon-carbon single bond and the other of the lines:

++++

represents a carbon-carbon single bond or a carbon-carbon double bond; wherein one of the lines:

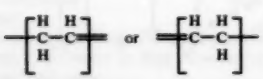
/+/+/+/+/+/

represents a carbon-carbon single bond and the other of the lines:

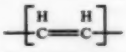
/+/+/+/+/+/

represents a carbon-carbon single bond or a carbon-carbon double bond; with the provisos that:

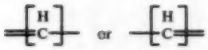
(i) when R_3 and R_4 are each hydrogen, the dashed line at the 7-5 position is a carbon-carbon single bond; n+0 and m is 1; Z represents ethylidene having the structure:



or ethylenyl having the structure:

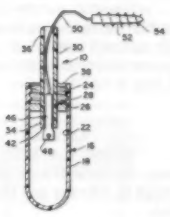


(ii) when one of R_3 or R_4 is methyl, then either the dashed line at the 7-5 position or the dashed line at the 7-4 position is a carbon-carbon single bond; and Z represents methylidene defined according to the structure:



(iii) when R_3 is methyl, then n is 1 and m is 0 and R_4 is hydrogen; and
(iv) when R_4 is methyl, then R_3 is hydrogen, n is 0 and m is 1.

4,428,388
ADJUSTABLE COSMETIC WAND
Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236, and Henry J. Cassai, 95-15 107 St., Ozone Park, N.Y. 11416
Filed Nov. 6, 1981, Ser. No. 318,895
Int. Cl.³ A45D *40/26*
U.S. Cl. 132—88.7 **10 Claims**



1. An adjustable cosmetic wand for use with a cosmetic container, the cosmetic wand comprising:
a container top having an outer shell;
a hollow shaft attached to the outer shell and extending interiorly and exteriorly thereof;
a rod reciprocal within the hollow shaft;
a flexible spring filament attached at one end to the reciprocal rod;
a cosmetic applicator brush attached to the opposite end of said flexible spring filament; and
means on said container top for reciprocating said rod within the shaft whereby the flexible spring filament and applicator brush are extended out of and retracted into the shaft and container top.

4,428,389
DENTAL FLOSS DISPENSER ADAPTED TO THE CAP OF THE COMMON TOOTHPASTE
Sergio Sanchez Cordero, Amores #28-PB Col. del Valle, Mexico 12 D.F. Mexico City, Mexico
Filed Oct. 17, 1980, Ser. No. 198,123
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 A **1 Claim**

1. In combination with a toothpaste tube having a closure cap thereon, a dental floss dispenser comprising;
a main body having a cylindrical outer wall and an opening at the top thereof,
a cap for said opening secured to said body by a snap fit, said cap having a protrusion at the top thereof for aiding the removal of said cap from the main body,
a socket having an outer conical wall extending within said

main body and dimensioned to receive the closure cap of the toothpaste tube, said socket extending up from a bottom end plane of said main body,

a spool of dental floss mounted for rotation on the outer wall

of said socket, an end of the dental floss being threaded thru a small opening in the cylindrical wall of the main body for dispensing the floss,

a cutting member mounted on the body for cutting said floss at a desired length.

4,428,390

CARRYING DEVICE FOR CRUTCHES

Joseph L. Baird, 336 Park Ave., Kent, Ohio 44240

Filed Jan. 11, 1982, Ser. No. 338,588

Int. Cl.³ A61H *3/02*

U.S. Cl. 135—66 **1 Claim**

1. A device for attachment to crutches to enable the user of the crutches to carry large objects, bulky objects, and other difficult-to-carry objects, the device comprising:

(a) an elongate aluminum tube, the tube having a circular cross-section, the tube being about 12 inches long and 1.25 inches in diameter;

(b) end closures for the tube, at least one of the closures being removable and in the form of a rubber stopper, the rubber stopper also carrying a post to which a key ring is secured, the key ring enabling keys to be carried within the tube;

(c) connecting means for attaching the tube to the crutch, the connecting means enabling the tube to be rigidly secured a pre-determined distance from the crutch and generally parallel with an elongate main crutch support, the connecting means including a first band encircling the tube, the first band including generally parallel legs, a second band encircling the crutch, the second band including generally parallel legs, channel shaped members into which the legs of the first and second bands can be inserted, the channel shaped members and the legs including openings through which bolted fasteners can be inserted and tightened, thereby attaching the tube rigidly to the crutch without modification of either the tube or the crutch;

(d) a flexible casing disposed about the tube and the crutch, the casing being releasably secured in place about the tube and the crutch by means of an interlocking hook and loop fastener, the casing also including the plurality of receptacles for receiving objects such as checkbooks, address books, pencils, and the like, the receptacles being attached to the outer portion of the casing; and

(e) a rope and a net having a drawstring being disposed within the tube, the net and the rope being attachable to the tube so that large, bulky objects can be carried.

4,428,391

CIRCUIT FOR PNEUMATIC CONTROLLERS

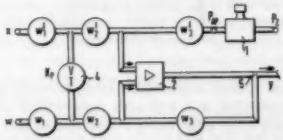
Horst Bader, Filderstadt, Fed. Rep. of Germany, assignor to Eckardt AG, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,704

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019360

Int. Cl.³ G05D *16/00*

U.S. Cl. 137—84 **6 Claims**



1. A circuit for pneumatic controllers, the circuit comprising a measured-value input line means, a desired-value input line means, at least one differential amplifier means having input pressure chambers adapted to be exposed to pressures in the respective measured-value and desired-value input line means, a line means being provided for connecting the input line means to each other, an adjustable throttle means being arranged in the connecting line means, at least three pair of throttle resistor means being provided, one throttle resistor means of each pair of the throttle resistor means being arranged in the measured-value input line means, and the second throttle means of each pair of throttle resistor means being arranged in the desired-value input line means, each throttle resistor means of each pair of throttle resistor means having an identical resistance value, the connecting line means being arranged between the first pair of throttle resistor means and the second pair of throttle resistor means and the differential amplifier means being arranged between the second pair of throttle resistor means and the third pair of throttle resistor means.

4,428,392

BREATHING VALVE

Leon Jones, Huntington Beach, and Orland W. Wilcox, Pasadena, both of Calif., assignors to Protection, Inc., Pomona, Calif.

Filed Dec. 24, 1981, Ser. No. 334,263

Int. Cl.³ A62B *9/02*; F16K *7/18*

U.S. Cl. 137—102 **15 Claims**

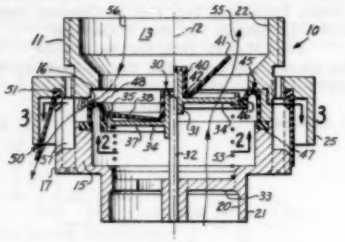
1. A breathing valve for the selective entry of a gas to be breathed, and exit of exhaled gas, said valve comprising:

a body having an axis, an internal cavity, a peripheral wall having an annular inner surface facing into said cavity,

and an outer surface facing outside of said cavity, said wall having an exit port extending between said surfaces, said exit port where it intersects said surface being surrounded by portions of said surfaces, said inner surface having said axis as its center of curvature, said body having an inlet port and a connector port entering said cavity, said inlet port being adapted to be connected to a using device;

a piston movably mounted in said cavity, centered on said axis, said piston having a first and a second side, said first side communicating with said inlet port, and said second side being communicable with said connector port, a passage extending between said sides, a seat encircling said passage on said second side, and an inlet flapper valve having a movable portion adapted to overlay and close said passage at said second side by bearing against said seat, and to be moved away from said seat to open the same;

a central axial shaft extending into said cavity, a central spindle on said piston which is slidably fitted on said shaft, said flapper valve being mounted on said spindle;



a peripheral rolling diaphragm having an inner and an outer concentric edge, and a flexible imperforate web between them, said inner edge being connected to said piston, and said outer edge being connected to said body adjacent to said exit port, whereby axial movement of said piston in one direction tends to lay part of said web against said inner surface and cover and close said exit port, and in an opposite direction to move away from said exit port and open the same, one side of said diaphragm being exposed to pressure from said inlet port, and the other side being exposed to pressure from said connector port and when and where it is adjacent to said exit port, there is is exposed to pressure in said exit port;

an outlet check valve mounted to said body adjacent to said outer surface and adapted to be moved against said outer surface to close said exit port and away from it to open the same; and

bias means biasing said piston in the direction tending to cause said rolling diaphragm to close said exhaust port.

4,428,393

QUICK VENT RESPONSE VALVE

Patrick J. Anderson, Batavia, and Andrew A. Kenny, Roselle, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 18, 1982, Ser. No. 349,741
Int. Cl.³ F16K *17/02*
U.S. Cl. 137—117 **14 Claims**

1. A quick response valve comprising:

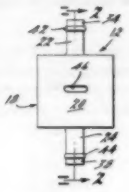
means defining a source port adapted for fluid communication with a fluid pressure source;

means defining an output port adapted for fluid communication with a controlled pneumatic device;

means defining an atomspheric vent;

means defining a flow restricting passageway fluidly interconnecting said source and output ports; and

valve means operative to isolate said vent from said output port when fluid pressure within said output port exceeds fluid pressure within said source port and to establish a path of fluid communication between said output port and vent when fluid pressure within said output port is less than fluid pressure within said source port, said path of



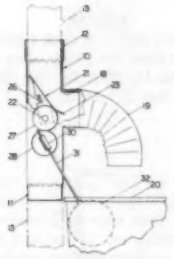
fluid communication being larger than said flow restricting passageway.

4,428,394

BAFFLE MECHANISM AND INSERT UNIT FOR DOWNSPOUT

Jack C. Wright, deceased, late of Bloomfield, N.J. (by Charlotte M. Wright, executrix), assignor to Charlotte M. Wright, executrix, Bloomfield, N.J.

Filed Jun. 1, 1981, Ser. No. 268,857
Int. Cl.³ G05D *9/02*
U.S. Cl. 137—122 **13 Claims**



1. A downspout baffle mechanism for downspouts of a generally rectangular cross section, said mechanism comprising a baffle member mounted on a pivot axis which traverses, at the center line, the long dimension of said rectangular cross section and is aligned with a flanged side opening in the downspout, said baffle being a plate member having offset parallel flanges keyed to said pivot axis, the lower end of said plate member being curved away from the pivot axis to enter said side opening in all positions of movement of the baffle member, edge portions of the plate member being contoured to closely engage inner downspout surfaces when angularly traversing the downspout while permitting the plate member to substantially close the side opening when a baffle member is pivoted to provide juxtapositioned alignment of the plate member with the downspout wall containing such opening, said pivot axis having a radially extended integral member externally of the downspout rotatably engaging a radially extended portion of a second external member mounted on a pivot axis below and parallel to the first pivot axis, said second external member having offset means engaging a vertically movable float, whereby upward movement of the float is translated to pivotal movement of the baffle from said downspout traversing position to that of juxtapositioned alignment with the downspout wall.

4,428,395

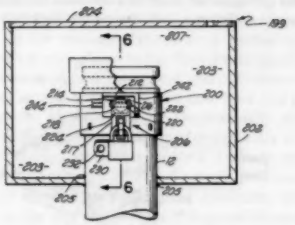
LOCK APPARATUS FOR STORAGE TANKS

Sergio M. Bravo, 1823 N. Hill Dr., South Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 129,509, Mar. 11, 1980, Pat. No. 4,345,617. This application Jan. 28, 1981, Ser. No. 229,225 The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ F16K *35/06*

U.S. Cl. 137—385 **12 Claims**



1. A lock apparatus for attachment to a pipe, defining a pipe passageway, communicating with a storage tank for preventing passage of a foreign object or substance into the storage tank through the pipe passageway, the lock apparatus comprising:

a housing having a housing passageway therethrough for attachment to the pipe with the housing passageway in coaxial alignment with the pipe passageway, the housing having a transverse orifice therethrough;

a valve assembly pivotally mounted in the housing for selectively obstructing the housing passageway comprising:

a shaft pivotally mounted in the housing in transverse relationship to the housing passageway with one end of the shaft extending through the transverse orifice of the housing,

closure means fixed to the shaft in the housing passageway for being pivoted by the shaft, the closure means having a circumferential edge spaced from the housing, and

seal means attached to extend from the circumferential edge of the closure means for contacting and sealing the space between the housing and the circumferential edge of the closure means when the valve assembly is pivoted to obstruct the housing passageway;

a latch member pivotally attached to the one end of the shaft;

a lock flange fixed to the housing externally of the housing passageway and adjacent the transverse orifice for selectively engaging the latch member and interconnecting the latch member to the lock flange; and

a tamper prevention flange fixed to the external surface of the housing in linear alignment with the transverse orifice and the lock flange.

4,428,396

ADJUSTABLE VALVE ASSEMBLY

Gerald E. Wall, Culpeper, Va., assignor to City Tank Corporation, Culpeper, Va.

Continuation of Ser. No. 926,519, Jul. 19, 1978, abandoned. This application Jan. 27, 1983, Ser. No. 461,597

Int. Cl.³ F16K *17/18*

U.S. Cl. 137—493.9 **22 Claims**

1. A valve assembly for providing fluid flow at varying rate in accordance with the input pressure of fluid to the valve assembly comprising:

a body having a fluid passageway therethrough including first and second ports,

engageable first and second valve elements movably disposed in said fluid passageway between said ports,

a first biasing means disposed in said body for yieldably biasing said first valve element into engagement with said second valve element,

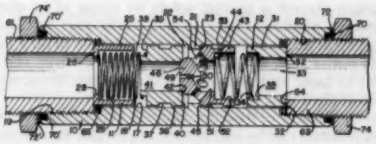
a second biasing means disposed on said body for yieldably biasing said second valve element into engagement with said first valve element,

an abutment means disposed on said body engageable by said first and second valve elements for restricting the movement of each said valve elements toward the other under the influence of said biasing means,

said first valve element having a main fluid passageway therethrough intercommunicating said first port and said second valve element when said valve elements are disposed in engagement,

said second valve element having a primary fluid passageway therethrough intercommunicating said main fluid passageway of said first valve element and said second port when said valve elements are disposed in engagement,

said second valve element having at least one secondary fluid passageway intercommunicating said first valve element and said second port whereby fluid flow at rela-



tively high rates of flow occurs through said primary fluid passageway and said secondary fluid passageway and said main fluid passageway when the input pressure is above a predetermined value with flow being restricted at a lower rate to the primary fluid passageway and the main fluid passageway when the input pressure is below a predetermined value,

an externally operable adjustment means for selectively varying the force with which said first and second biasing means, respectively, urge said first and second valve elements into engagement,

said adjustment means including a threaded connector mounted for axial reciprocation in said body, one of said biasing means having an end engageable with one of said valve elements whereby movement of said threaded connector effects variation of the force exerted by said one of said biasing means on said one of said valve elements,

a first retaining means disposed within said body for retaining said one of said biasing means, and

said threaded connector being drivingly engageable with said first retaining means.

4,428,397

FLUID FLOW CONTROL DEVICE

Dan Bron, 36 Palmach Str., Haifa, Israel

Continuation of Ser. No. 842,168, Oct. 14, 1977, abandoned. This application Aug. 16, 1982, Ser. No. 408,161 Claims priority, application Israel, Oct. 27, 1976, 50771

Int. Cl.³ G05D *7/01*

U.S. Cl. 137—504 **4 Claims**

1. A fluid flow-rate control device comprising:

a housing having two interlocking parts;

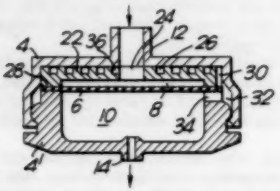
an elastic stretchable membrane clamped along its periphery, inside the housing, between the two interlocking parts, said membrane dividing the interior of said housing into a first chamber and a second chamber;

an inlet port of said housing leading from a fluid source and communicating solely with said first chamber; and

an outlet port of said housing communicating with said second chamber;

wherein said first and second chambers are in fluid communication via at least one passageway extending in part beyond the periphery of the membrane and along an inner surface of at least one of the parts of the housing and leading from said

first chamber to said second chamber, said passageway communicating solely with the first and second chambers and including at least one portion comprising a spirally extending channel in which flow is relatively restricted, the dimensions of the passageway remain unchanged during operation, and said membrane is fixedly held and positioned between said chambers so that when said membrane is ex-



posed to a fluid pressure differential, it is stretched and a portion thereof is moved, solely by virtue of its elasticity, between positions closer to said outlet port to cause said portion of said membrane to restrict the rate of flow through said outlet port, and positions farther away from said outlet port to cause said portion of said membrane to increase the rate of fluid flow through said outlet port,

whereby the flow of fluid through said outlet port is controlled at a constant rate by said membrane, despite variations in the fluid pressure at, at least, one of the ports.

4,428,398

PRESSURE CONTROL VALVE

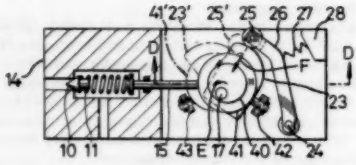
Akio Mito, Yokohama, and Kentaro Tanaka, Tokyo, both of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,811

Claims priority, application Japan, Mar. 23, 1981, 56-42104

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—530 **9 Claims**



1. In a pressure control valve including a valve, a spring for pressing the valve, and a power input means for compressing the spring, the improvement which comprises a backup force-generating mechanism for producing and directing a backup force counter to the direction in which the reaction force due to the compression of said spring is exerted on said input means, so as to impart said backup force to said input means said backup force-generating mechanism comprising a cam for backup force generation connected to said power input means to turn in proportion to the amount of input displacement of said input means, and a cam presser means for producing a cam-turning force that varies with the turning of said cam.

4,428,399

POWER STEERING APPARATUS

Naosuke Masuda; Yoshio Tobisawa, and Tadaaki Fujii, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

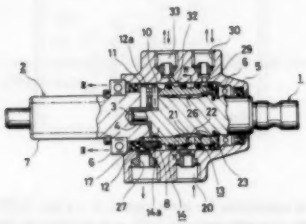
Filed Jul. 16, 1981, Ser. No. 284,144

Claims priority, application Japan, Sep. 17, 1980, 55-128701; Mar. 13, 1981, 56-36042

Int. Cl.³ F15B *9/00*

U.S. Cl. 137—625.22 **14 Claims**

1. A power steering apparatus including an input shaft adapted to be connected to a steering wheel, an output shaft disposed in coaxial relationship with the input shaft and adapted to be connected to a steerable road wheel, and a control valve including a pair of control valve elements connected for integral rotation with the input shaft and the output shaft, respectively, for controlling the supply to or discharge from a power cylinder of a hydraulic fluid in accordance with a relative angular displacement between the pair of control valve elements, wherein the improvement comprises: a substantially C-shaped spring in the form of a cylinder having a longitudinal split therein defining a gap, the radial thickness of said spring



increasing gradually from said gap to a point diametrically opposite said gap, mating portions formed on said input shaft and said output shaft, respectively, for integral rotation therewith, said mating portions being engageable with said substantially C-shaped spring so that the end faces of said gap are disposed on opposite sides of said mating portions, whereby the resilience of said spring maintains said mating portions in given positions.

4,428,400

ELECTRICALLY AND HYDRAULICALLY ACTUATED FLOW-DISTRIBUTING VALVE UNIT

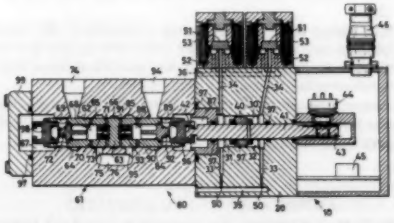
Paolo Tantardini, Milan, Italy, assignor to ATOS Oleodinamica S.p.A., Milan, Italy

Continuation of Ser. No. 122,802, Feb. 20, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,723

Claims priority, application Italy, Feb. 28, 1979, 20935/79[U]; Apr. 12, 1979, 21343/79[U]

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—625.61 **6 Claims**



1. An electrically and hydraulically actuated flow-distributing valve unit comprising an electrical-hydraulic actuator comprised of a body having an interior provided with a cylindrical seating which is adapted to receive a sliding piston which partitions the seating into two hydraulically separated chambers individually connected to intake and outlet ducts for a pressurized fluid, said intake ducts having fixed throttled passageways, said outlet ducts exhibiting throttled passageways of variable width, the degree of throttling being adjustable by virtue of electrically and magnetically actuated valve cores which restrict the flow and originate controlled pressure drops, said piston being extended at both ends into two stems, a flow-distributing valve integrally connected to said actuator, said valve having a slider gliding therein and connected to

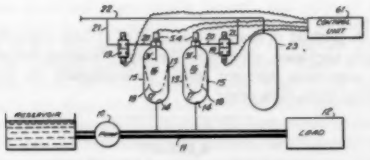
either stem of said actuator, said valve having ports adapted to be connected to fluid utilization, fluid discharge, fluid intake and pressure compensator ducts, said flow-distributing valve being composed by a valve body in the interior of which there is formed a cylindrical seat having said slider gliding therein, said cylindrical seat having formed therethrough flow-passageways for a pressurized fluid, the interior of said slider having at least an axial channel-shaped hollow space which communicates with a first bore radially passing through the slider and which, in alternate sequence consistently with the position of the slider, is either opened towards the port adapted for connection to the utilization ducts, or is opened towards the port adapted for connection to the fluid discharge ducts, or remains in the shuttered position against said cylindrical seat, a first set of bores spaced apart from said first bore and passing radially through the slider which are longitudinally arranged serially and which, in alternate sequence consistently with the position of the slider, are either opened towards the port adapted for connection to the fluid intake ducts, or towards the port adapted for connection to the fluid utilization ducts, or which remain in the position in which they are shuttered by said cylindrical seat, said set of bores having diameters which gradually increase in size in a direction toward said first bore, the area of the cross-sectional surface of said first bore being generally double the sum of the areas of the cross-sectional surfaces of said set of bores, at least another bore spaced apart from the previously named bores, the said another bore passing radially through the slider and which, in alternate sequence consistently with the slider position is either opened toward the port adapted for connection to the pressure compensator ducts or remains in the position in which it is shuttered by said cylindrical seat, nonreturn valve means being provided in said space for cutting off the fluid which comes from the port of the fluid intake duct, and latching means at the slider ends for latching to at least one of said two stems.

4,428,401

FAILURE SENSING HYDRAULIC ACCUMULATOR AND SYSTEM

Hugh H. Chun, Hacienda Heights, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Aug. 12, 1982, Ser. No. 407,564
Int. Cl.³ F16L *55/02*
U.S. Cl. 138—30 **5 Claims**



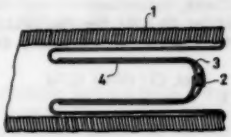
1. An accumulator device comprising a pressure vessel having an oil port at one end and a gas charging port at the other end, fitting means at said oil port for coupling said oil port to a hydraulic line, a bladder member disposed within said vessel and dividing the same into a gas chamber and an oil chamber in communication respectively with said gas and oil ports, and a capacitive probe sensor member extending through said gas port into said gas chamber said sensing means being responsive to the presence of liquids and to proximity of said bladder member.

4,428,402

METHOD AND APPARATUS FOR CLOSING ONE END OF SHIRRED SYNTHETIC CASING STICK AND SHIRRED SYNTHETIC CASING STICKS CLOSED

Seiji Kubo, Tokyo, and Kengi Ishibashi, Tami, both of Japan, assignors to Kubo Sekkei, Ltd., Japan

Filed Oct. 13, 1981, Ser. No. 310,730
Claims priority, application Japan, Oct. 25, 1980, 55-149942
Int. Cl.³ A22C *13/00*
U.S. Cl. 138—118.1 **4 Claims**



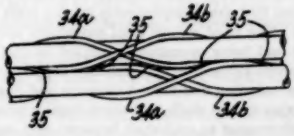
1. A shirred synthetic casing stick closed at one end, said stick consisting of a shirred synthetic casing portion and an end portion of said casing extended to form an end casing portion, said end casing portion being twisted at a point to form a twisted closure of the same material forming said casing portion, an inner end casing section on one side of said closure, and an outer end casing section on the other side of said closure, said outer end casing section being turned inside out and covering said twisted closure and at least a part of said inner end casing section, wherein the twist is located at a distance 1–2 times the diameter of the stick from the end of said end casing portion, wherein the inner end casing section extends within the interior of the stick inwardly along the inner wall of the stick and then outwardly within the spacing defined by the inwardly extending portion of the inner end casing section, and wherein the outer end casing section covers at least a part of the outwardly extending portion of the inner end casing section.

4,428,403

CONDUIT HAVING SPIRALLY WOUND MONOFILAMENT MATERIAL

Kyu H. Lee, King of Prussia, and Christopher H. Porter, Newtown Square, both of Pa., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Continuation of Ser. No. 218,340, Dec. 19, 1980, abandoned.
This application Jun. 4, 1982, Ser. No. 385,178
Int. Cl.³ F16L *11/12*
U.S. Cl. 138—130 **4 Claims**



1. Conduit useful, for example, in a heat exchange device or in a device for the treatment of blood, said conduit consisting essentially of hollow tubing and at least two continuous lengths of monofilament material, said hollow tubing consisting essentially of a flexible polymeric material and having substantially constant inside and outside diameters and a continuous lumen extending the length thereof, one of said lengths of monofilament material being wrapped in a generally spiral configuration around the outer surface of said tubing in a first direction, another of said lengths of monofilament material being wrapped in a generally spiral configuration around the outer surface of said tubing in a direction opposite said first direction

to thereby provide crossover points at which said two lengths of monofilament material are frictionally engaged, said conduit being formed into a coil in which the degree of contact between adjacent sections of said tubing is minimized and in which there are spaces for the flow of a fluid over the outer surfaces of said tubing.

4,428,404

PICK-FINDING MECHANISM WITH CREEPING SPEED

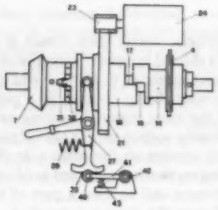
Walter Kleiner, Hirzel-Zurich, Switzerland, assignor to Staeubli Ltd., Horgen-Zurich, Switzerland

Filed Oct. 20, 1981, Ser. No. 313,128

Claims priority, application Switzerland, Oct. 20, 1980, 7825/80

Int. Cl.³ D03D *51/08*

U.S. Cl. 139—1 E **9 Claims**



1. In a method of operating a pick-finding mechanism which is operatively coupled to a motor and to a weaving machine having a dobby and which includes first coupling means for selectively operatively coupling said weaving machine and said dobby and second coupling means for selectively operatively coupling said motor and said dobby, including the step of respectively engaging and disengaging said first and second coupling means so that said weaving machine is operatively coupled to and drives said dobby and the step of respectively engaging and disengaging said second and first coupling means so that said motor is operatively coupled to and drives said dobby, the improvement comprising the step of simultaneously engaging said first coupling means and said second coupling means so that said motor is operatively coupled to and drives both said weaving machine and said dobby.

2. A pick-finding mechanism for a weaving machine having a dobby, comprising a shaft supported for rotation about a first axis, a first element fixedly secured to said shaft and operatively coupled to said dobby, a second element supported on said shaft at a location spaced from said first element for rotation about said first axis independently of said shaft, said second element being fixed against axial movement with respect to said shaft and being operatively coupled to said weaving machine, a third element axially slidably supported on said shaft between said first and second elements and fixed against rotation relative to said shaft, said third element being axially movable with respect to said shaft between first and second positions, a fourth element supported on said third element for rotation relative to said third element and said shaft about said first axis, said fourth element being movable relative to said shaft between third and fourth positions, a motor which is operatively coupled to said fourth element and effects rotation first and fourth elements when said fourth element is in said third position, and second coupling means for operatively coupling said second and third elements when said third element is in said second position, said first and second coupling means respectively being disengaged when said fourth and third elements are respectively in said fourth and first positions, and retaining means for maintaining said third and fourth elements in fifth and sixth positions, respectively, in which said first and second coupling means are both operatively engaged.

4,428,405

ELECTRONIC CONTROL DEVICE ON A GRIPPER SHUTTLE WEAVING MACHINE

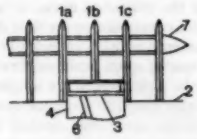
Walter Schümperli, Wetzikon, Switzerland, assignor to Loepfe Brothers Limited, Zurich, Switzerland

Filed Dec. 4, 1981, Ser. No. 327,559

Claims priority, application Switzerland, Dec. 13, 1980, 9190/80

Int. Cl.³ D03D *51/40*

U.S. Cl. 139—341 **6 Claims**



1. An inductive projectile sensor on a gripper shuttle weaving machine comprising a lathe beam and thereto attached projectile guide teeth made of magnetizable material, for producing a control signal indicative of the projectile passage, wherein the projectile sensor comprises:

an induction coil located at a top surface of the lathe beam and surrounding at least one of the guide teeth; and

means for magnetizing at least said one guide tooth.

4,428,406

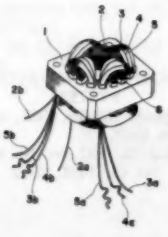
METHOD OF SHAPING COIL ENDS OF AN ELECTRIC APPLIANCE

Tokuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1981, Ser. No. 237,406

Int. Cl.³ B21F *1/00*

U.S. Cl. 140—105 **5 Claims**



1. A method of shaping coil ends of at least one coil of an electric appliance, comprising the steps of shaping the coil ends into respective different shapes to distinguish the coil end portions from each other.

4,428,407

TREE-PROCESSING APPARATUS

Claude Bourbeau, 855 - 27th St., St. Georges-Ouest, Canada

Filed Nov. 17, 1981, Ser. No. 322,363

Int. Cl.³ A01G *23/02*; B27C *9/00*

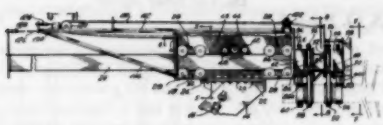
U.S. Cl. 144—2 Z **4 Claims**

1. A tree-processing unit adapted for installation on a conventional motorized equipment having a main base and a boom support extending upwardly from said main base, said boom support pivotally mounted on said main base about a horizontal axis, comprising:

(a) a tubular member detachably secured to said boom support;

(b) an elongated boom extending through both ends of said tubular member;

(c) means for hingedly mounting said tubular member at the top of said boom support, so as to permit pivotal of said boom support about its horizontal axis to a position substantially parallel to said boom and so reduce the height of the boom above ground to a minimum to permit transportation



of the motorized equipment on a trailer under bridges and other overhead obstacles;

(d) guide means located within the tubular member for supporting and guiding the boom through the tubular member; and

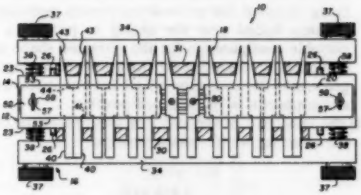
(e) hydraulically-operated means mounted on said tubular member and on the front end of the boom for gripping and delimbing a felled tree.

4,428,408

DOVETAILING JIG

Kenneth M. Grisley, 238 Bouchie St., Quesnel, British Columbia, Canada (V2J, 1L8)

Filed Oct. 5, 1981, Ser. No. 308,496
Int. Cl.³ B27F *1/14*
U.S. Cl. 144—144.5 R **14 Claims**



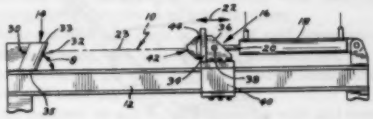
12. A dovetailing jig for supporting and guiding a power tool fitted with a depending cutter bit, said jig comprising a base frame having end brackets connected by a longitudinal frame member, said end brackets each having a vertical leg and a horizontal leg, a support extending between the horizontal legs, a plurality of guide fingers arranged in pairs along the support to extend transversely thereof, said pairs of guide fingers each having opposite ends projecting beyond side edges of the support and being shaped to provide guiding surfaces corresponding to complementary joint members, securing means for fastening each guide finger to the support whereby the transverse spacing between each pair of guide fingers and the transverse spacing between adjacent pairs of guide fingers are both selectively variable, and clamping means for securing a workpiece to the base frame in either a first or a second position, said first position disposing a workpiece parallel to the guide fingers and with an end edge thereof adjacent the guiding surfaces along one side edge of the support, said second position disposing a workpiece perpendicular to the guide fingers and with an end edge thereof adjacent the guiding surfaces along an opposite side edge of the support, said guide fingers underlying the power tool as the depending cutter bit is moved between the guiding surfaces to cut joint members in a workpiece in the first position and complementary joint members in a workpiece in the second position.

4,428,409

LOG SPLITTER WITH A TAPERED WOOD PENETRATING MEMBER ON THE RAMHEAD

Francis J. Roetzler, Box 121, Rte. 1, Buffalo, Minn. 55313

Filed May 28, 1981, Ser. No. 267,798
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 A **4 Claims**



1. In a wood splitter having a frame, a wood splitting member fixed relative to the frame, and a movable ramhead adapted to move wood to be split against the wood splitting member at a controlled rate, the improvement comprising:

a pusher plate forming a portion of the ramhead;

a generally conical member on said pusher plate facing toward the splitting member and having outer surface portions tapering from a generally narrow penetrating end facing the splitting member to a base of smaller size than the pusher plate mounted on said pusher plate, the tapered outer surface portion insuring that the penetrating end of the member will engage an end surface of a piece of wood as the wood also engages the splitting member;

a hydraulic motor for moving the pusher plate in the direction of the splitting member;

a control valve having a manually postitionable control for controlling the flow of hydraulic fluid from a source under pressure to the hydraulic motor, the outer surface portion of the generally conical member having the surface of a right cylindrical cone with a base and a height and truncated at the penetrating end, the penetrating end having a diameter substantially between 15% and 35% of the diameter of the base, the height of the generally conical member from the base to the penetrating end being in the approximate range of 40% to 60% of the base, and said generally conical surface having an angle of taper which is approximately between 80° and 100° so that the conical member will penetrate the wood at a controlled rate as the force input on the ramhead increases under the control of the manually positionable control, thereby establishing a minimum time element before the end surface of a piece of wood being split bottoms on the ram pusher plate as the maximum splitting effect is accomplished.

4,428,410

METHOD FOR COMPRESSING WOODEN ELEMENTS

Anders Strandberg, Eskilstuna, Sweden, assignor to AB Nils Darje, Ljusdal, Sweden

PCT No. PCT/SE81/00289, § 371 Date Jun. 28, 1982, § 102(e) Date Jun. 28, 1982, PCT Pub. No. WO82/01504, PCT Pub. Date May 13, 1982
PCT Filed Oct. 8, 1981, Ser. No. 394,928
Claims priority, application Sweden, Mar. 24, 1981, 8101862
Int. Cl.³ B27M *1/02*
U.S. Cl. 144—361 **4 Claims**

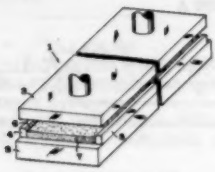
1. The method of compressing at least one flat wooden element having knots therein comprising the steps of:

inserting an elastic material layer between a pair of spaced-apart press plates which are moveable with respect to each other, said elastic material layer being softer than said wooden element;

interposing said wooden element between said elastic material layer and one of said press plates;

displacing said pair of press plates toward each to a predetermined spacing thereby compressing the entire surface of said wooden element and elastic material layer, the thickness of said elastic material layer in the compressed state

being at least one-half the thickness of the compressed wooden element, portions of the knots in said wooden element being forced out of said element and into said elastic material layer without breaking to shivers by the pressure exerted thereon; and



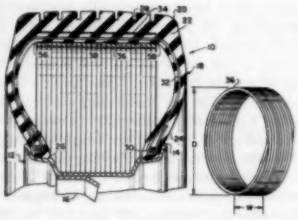
removing the portions of said knots projecting from the surface of said wooden element and received in said pad during said displacing step.

4,428,411

RUN-FLAT TIRE AND METHOD OF MAKING SAME

Edward G. Markow, Oakdale, and M. Alan Kopsco, Wantagh, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,583
Int. Cl.³ B60C *17/04*
U.S. Cl. 152—330 RF **17 Claims**



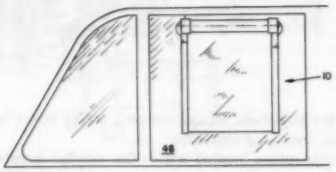
1. A run-flat pneumatic radial tire having a casing with a tread portion in the crown thereof, sidwalls extending from said crown on either side to annular bead portions on the inner periphery on each side of said tire, said beads being adapted to mount said tire on the rim of a wheel, tensioned annular belt means in said tire crown radially inwardly of said tread portion, a resilient annular compression element of high strength material comprising a helical coil, the coils of which are adjacent one another in a stressed condition, bonded, as an added stage in the course of building the tire or as a retrofit operation on an existing radial tire, inside said casing on the inside surface of the crown thereof radially inwardly of said tread portion, said sidewalls having therein a multiplicity of closely spaced substantially radial spoke-like reinforcing elements cooperating with said compression element, said radial elements having freedom of shear with respect to one another and being connected to said beads and extending therefrom to at least the crown region of said tire, and wherein inflation means inflated inside said helical compression element prior to the bonding thereof to a pressure approximately twice the normal operating pressure of said tire has been used to prestress said helical compression element to cause the coils thereof to have relative movement with respect to one another whereby the circumferences of said compression element and said inside surface of said tire crown are expanded to greater than their normal diameter at normal operating pressure so that a prestress is transmitted to said belt means, said prestress being locked in when said compression element is bonded, wherein said tensioned annular belt means act as a supplemental structure with said stressed compression element to increase the load-capability thereof in the run-flat condition of said tire.

4,428,412

PORTABLE INSTANT SHADE

Andras I. Toro, 7234 Plank St., El Cerrito, Calif. 94530

Filed Sep. 29, 1982, Ser. No. 439,572
Int. Cl.³ E04F *10/06*
U.S. Cl. 106—23 R **1 Claim**



1. A portable shade device for use in vehicles and the like for selective shading purposes, comprising:

(a) a casing having a cap at each end,

(b) elongated roller means within the casing carrying a flexible shade capable of being retracted into a rolled up position on the roller means and extended to provide shade,

(c) attaching means arranged on the roller means for mounting the roller means on an interior surface of the vehicle,

(d) one leg having a channel therein depending from each cap, one leg being longer than the other leg,

(e) an arm pivotally connected to each leg having a groove therein, one arm being longer than the other arm, the arms being adopted for pivotal movement between a fixed position folded near the casing to provide a compact portable configuration for the retracted shade and a second position extending downward from the legs with the grooves in the arms providing a track to receive the shade and support it in its extended position

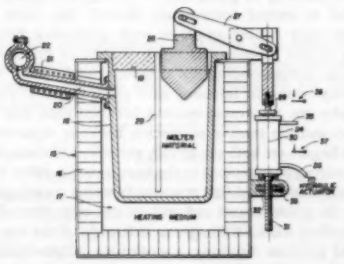
(f) the outer end of the long arm fitting into the channel of the other leg in the folded position.

4,428,413

HIGH ACCURACY INJECTOR FOR DIE CASTING MACHINES AFFORDING AUTOMATIC MELT LEVEL COMPENSATION

William M. Lester, 4389 White Cedar La., Delray Beach, Fla. 33445

Filed Oct. 16, 1981, Ser. No. 311,928
Int. Cl.³ B22D *17/04, 17/30*
U.S. Cl. 164—155 **5 Claims**



1. In a mold charge injector for delivering of a measured charge of molten material into a mold chamber by controlled movement of a displacement plunger into a melting pot containing the molten material, the improvement for keeping

molten material in the melting pot at a precisely determined datum level as successive charges are delivered from the pot, comprising in combination, a displacement plunger operational in the melting pot to displace molten material for a plurality of measured charges during supply of a successive series of charges from the pot by movement thereinto and to produce changes of the level of molten materials in the pot as it moves thereinto, first charge delivery movement means for inserting the displacement plunger a controlled distance into the melting pot to measure out a charge of material and inject it into the mold chamber, and second automatic vernier datum level control supplemental movement means comprising a screw adjustment mechanism for adjustably relatively changing the displacement position of said plunger into the molten material in said melting pot and an automatic control circuit making adjustments thereto in increments over a plurality of injection strokes of said first movement means as successive charges are removed from the melting pot to displace the level of the molten material just enough to provide a substantially constant starting datum level of molten materials for the plunger to begin a following injection stroke in response to the first movement means.

4,428,414

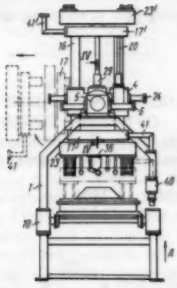
APPARATUS FOR CLEANING FACED METAL MOULDS OF USED FACING

Anatoly D. Teplinsky, ulitsa Generala Petrova, 27, korpus 1, kv. 73; Alexandr F. Jurchenko, ulitsa Paustovskogo, 7, kv. 68, and Grigory A. Yarovinsky, Treugolny pereulok, 13, kv. 14, all of Odessa, U.S.S.R.

Filed Dec. 28, 1977, Ser. No. 865,220

Int. Cl.³ B22D *29/00*

U.S. Cl. 164—158 **4 Claims**



1. An apparatus for cleaning faced metal moulds of used facing comprising:

a frame;

stationary bearings mounted in said frame;

a barrel journalled in said bearings for rotation about a horizontal axis;

first drive means for imparting said barrel rotation about a horizontal axis, mounted on said frame and geared to said barrel;

through orifices in said barrel;

bars passing freely through said orifices in said barrel and provided with two ends;

traverses rigidly fixed on each end of said bars;

second drive means reciprocating said bars together with said traverses with respect to said barrel;

rotatable plates mounted on said traverses and alternately coacting with separate parts of metal mould being cleaned;

third drive means geared to said rotatable plates rotating them horizontally;

working tools for chipping off used facing arranged on said rotatable plates;

a system for supplying a working agent for removing used facing having:

a valve source accommodated on said frame and connected to a working agent source;

receiving branch pipes mounted one each on each of said traverses and cooperating alternately with said valve during the reciprocation of said traverses;

conduits realized one each in each of said traverses and communicating with said receiving branch pipes;

headers mounted on said rotatable plates communicating with said conduits; and

nozzles mounted on and in communication with said headers whereby said headers supply and distribute working agent to said nozzles.

4,428,415

STRAND GUIDE ARRANGEMENT TO BE USED IN A CONTINUOUS CASTING PLANT HAVING THE FORM OF AN ARC

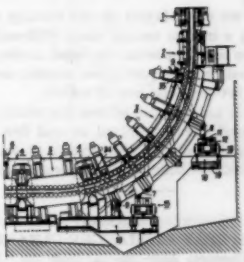
Werner Scheurecker, Linz; Erich Felbermayer, Wels, and Alfred Nagl, Steyr, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 3, 1980, Ser. No. 193,755

Claims priority, application Austria, Oct. 22, 1979, 6874/79

Int. Cl.³ B22D *11/12*

U.S. Cl. 164—448 **1 Claim**



1. In a strand guide arrangement to be used in a continuous casting plant having the form of an arc, in particular a steel slab continuous casting plant of the type including at least one, arcuate, horizontally displaceable supporting and guiding structure, the improvement comprising,

at least one intermediate trestle for mounting said at least one arcuate, horizontally displaceable supporting and guiding structure, said at least one intermediate trestle being displaceable in the plane of the arc,

at least one supporting trestle for supporting said at least one intermediate trestle, said at least one supporting trestle being displaceable transversely to the plane of the arc, and

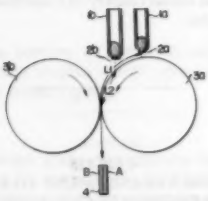
a stationarily arranged pressure medium cylinder connectable to said supporting trestle for displacing said supporting and guiding structure at a right angle to the plane of the arc,

said pressure medium cylinder having a stroke that is shorter than the total displacement path of said supporting trestle, said pressure medium cylinder including a piston rod having an extension, said supporting trestle being connectable to said extension at different distances from said pressure medium cylinder.

4,428,416
METHOD OF MANUFACTURING A MULTI-LAYER AMORPHOUS ALLOY

Senji Shimanuki, and Koichiro Inomata, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

PCT No. PCT/JP80/00080, § 371 Date Dec. 8, 1980, § 102(e) Date Dec. 8, 1980, PCT Pub. No. WO80/02242, PCT Pub. Date Oct. 30, 1980
Continuation of Ser. No. 220,032, Dec. 8, 1980, abandoned. This PCT application Apr. 21, 1980, Ser. No. 505,121
Claims priority, application Japan, Apr. 20, 1979, 54-52100
Int. Cl.³ B22D *11/06*
U.S. Cl. 164—461 **4 Claims**



1. A method for manufacturing a multi-layer amorphous alloy having two layers of amorphous alloy, comprising the steps of

ejecting a molten first metal on one of a pair of rollers rotating at a high speed or on a metal belt driven by the roller, and rotating the ejected metal with the rollers for rapid cooling;

forming two metal layers on the rotating roller or belt by ejecting a molten second metal different from said first metal on said first metal for rapid cooling; and

adhering said metal layers to one another under pressure and rolling between said pair of rollers;

wherein the temperature of said first metal, when said molten second metal is ejected on said first metal, is higher than the crystallizing temperature of said first metal and lower than the solidifying temperature of said first metal.

4,428,417
HEAT EXCHANGER CLEANER

Ramon J. Chesner, 2580 Buena Vista Dr., Brookfield, Wis. 53005

Filed Dec. 9, 1981, Ser. No. 328,872
Int. Cl.³ F28D *19/00*; F28G *9/00*
U.S. Cl. 165—5 **11 Claims**

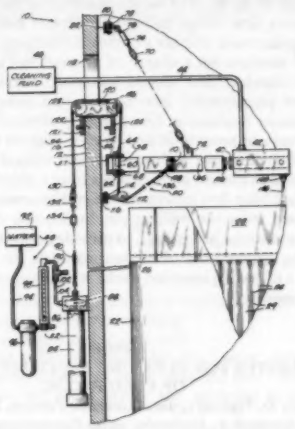
1. A core cleaner for temporary installation in a heat exchanger of the type having a generally cylindrical housing with inner and outer walls and an access opening in the inner wall, a core assembly of axially disposed heat exchange passages, said core assembly having first and second axial ends and being mounted within said housing, and first drive means for rotating said core assembly within said housing about their common axis, said core cleaner comprising:

A. a spray head for directing a jet of cleaning fluid through said core assembly;

B. an arm having a first end, pivot means for said first end, means detachably securing said pivot means to said inner wall, said arm having a second end for supporting said spray head, said arm being supported on said pivot means for swinging said spray head in a radial plane adjacent and generally parallel to one end of said core assembly;

C. second drive means having detachable securing means securing it to said inner wall, said drive means having a flexible member and means detachably connecting said flexible member to said arm to swing said arm in one direction in said plane for moving said spray head radially with respect to said core assembly; and

D. secure quickly operable fasteners securing said quickly detachable means to said inner wall when it is desired to operate said core cleaner and quickly detachable when it is desired to operate said heat exchanger without said core



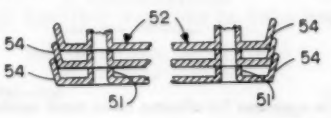
cleaner whereby said core cleaner is not exposed to normal operations of said heat exchanger;

whereby rotation of said core assembly to said first drive means and simultaneous radial travel of said spray head effected by said second drive means causes said spray head to dispense said cleaning fluid to each passage in said core assembly.

4,428,418
HEAT EXCHANGER FIN ELEMENT WITH FOLDED OVER SIDE EDGES

Marvin D. Beasley; Wayne G. Blystone, and Gerald W. Lemmon, all of Mount Vernon, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed May 17, 1982, Ser. No. 378,727
Int. Cl.³ F28F *1/32*
U.S. Cl. 165—76 **9 Claims**



1. A heat exchanger core assembly adaptable for allowing the passage of air therethrough comprising a plurality of spaced apart substantially parallel fin elements having a plurality of apertures extending therethrough, a plurality of substantially parallel tubular members adaptable for receiving and carrying a fluid member therethrough extending through the apertures in said fin elements defining an array of longitudinally and laterally disposed rows of tubular members, each pair of said fin elements defining a passageway therebetween for allowing air to flow therethrough, said fin elements having first and second opposed side portions extending in a direction substantially parallel to the direction of air flow through said core assembly, each of said fin elements including a folded over side edge extending along each of said first and second opposed side portions, said folded over side edges being adaptable for overlapping the folded over side edges of an adjacent fin element when said fin elements are positioned in close

abutting relationship with each other, said overlapping side edges being adhesively joined by an adhesive selected from the group consisting of an epoxy resin, a polycarbonate, a nylon and a polyester and forming a substantially air tight continuous core side on each opposite side of said plurality of fin elements for substantially preventing the leakage of air through the core sides.

4,428,419

TUBE-AND-FIN HEAT EXCHANGER

Evgeny V. Dubrovsky, ulitsa Chaikovskogo, 18, kv. 203, Moscow; Leonid A. Averkiev, ulitsa Gagarina, 40a, kv. 137, Orenburg; Viktor P. Dunaev, ulitsa I Vladimirskaya, 26, korpus 2, kv. 31, Moscow; Anatoly I. Kuzin, ulitsa Flotskaya, 17, korpus 1, kv. 106, Moscow; Natalya I. Martynova, ulitsa Komsomolskaya, 15, kv. 38, Ljubertsy Moskovskoi oblasti; Lev A. Folts, ulitsa Timiryazeva, 14, kv. 1; Arthur P. Shmelev, ulitsa Sukhareva, 36, kv. 61, both of Orenburg; Sergei S. Vronsky, ulitsa Chicherina, 26, kv. 27, and Evgeny V. Vasiliev, ulitsa 60 let Oktyabrya, 20, kv. 28, both of Orenburg, all of U.S.S.R.

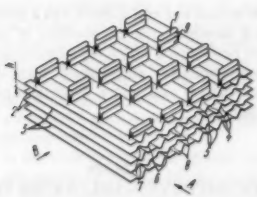
PCT No. PCT/SU81/00001, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02197, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 15, 1981, Ser. No. 305,631

Claims priority, application U.S.S.R., Jan. 28, 1980, 2876816

Int. Cl.³ F28D *1/00*

U.S. Cl. 165—151 **6 Claims**



1. A tube-and fin heat exchanger comprising tubes for the flow of a heat carrier at some temperature, which tubes are installed in broached holes provided in fins spaced apart and positioned so that adjacent fins and walls of adjacent tubes form a multiplicity of ducts for the flow of a heat carrier at a different temperature, each of the fins having projections, depressions and rectilinear portions, said projections and depressions of one fin being located respectively opposite projections and depressions on the adjacent fins and forming in said ducts symmetrical divergent-convergent portions for setting up turbulence in the wall-neighbouring layer of the heat carrier flowing therethrough, said rectilinear portions being disposed between the convergent-divergent duct portions and opposite each other on the adjacent fins so as to reduce interaction between a vortex formed in one divergent-convergent portion with a vortex formed in the next adjacent divergent-convergent portion.

4,428,420

HEAT ABSORBING ELEMENT AND METHOD OF MANUFACTURE

Stephen W. Blakely, Apt. A, 503 Beacon, Alton, Ill. 62002

Filed Jul. 16, 1981, Ser. No. 283,989

Int. Cl.³ F28F *1/14*

U.S. Cl. 165—183 **8 Claims**

1. A heat absorbing element formed from a single metal strip of substantially uniform thickness, said strip having longitudinal edge margins at opposite sides of the strip, said element comprising a tube having a wall comprising at least a double thickness of said strip seamed along a line extending longitudinally of the tube to seal the tube for flow therethrough of heat transfer fluid, and a pair of fins formed by said longitudinal edge margins extending generally axially with respect to the tube stretching out from said line of seam for collecting heat

and transferring it to the tube, each axial fin comprising at least one less thickness of said strip than the tube wall.

4,428,421

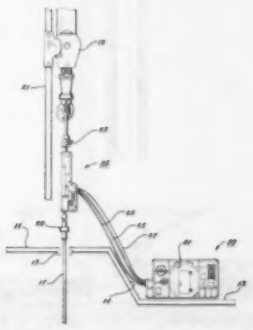
WIRELINE WINCH MOUNTING SYSTEM

E. Edward Rankin, Fort Worth, Tex., assignor to H-G Testing Company, Ventura, Calif.

Filed Sep. 14, 1981, Ser. No. 301,772

Int. Cl.³ E21B *19/00, 33/03*

U.S. Cl. 166—77 **7 Claims**



1. In an apparatus for running wireline tools in well conduit with a power driven drum, the improvement comprising:

a tubular member having mounting means for securing to the top of the well conduit and having a passage extending therethrough for the passage of wireline;

a sheave mounted adjacent the top of the tubular member for guiding wireline into the passage;

frame means for mounting the drum on a side of the tubular member with its axis perpendicular to the axis of the well conduit and below the sheave for reeving the wireline from the drum through the sheave; and

a cylindrical lift sub secured to the frame means and having a collar means for engagement by a set of elevators to lift the well conduit with drilling rig blocks by using the tubular member, frame means and lift sub as a link between the blocks and the well conduit.

4,428,422

DEVICE PROVIDED WITH RETRACTABLE ARMS FOR THE ANCHORING OF AN INSTRUMENT IN A CAVITY

Jean Laurent, Orgeval, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 9, 1982, Ser. No. 356,614

Claims priority, application France, Mar. 9, 1981, 81 04811

Int. Cl.³ E21B *23/00*

U.S. Cl. 166—212 **12 Claims**

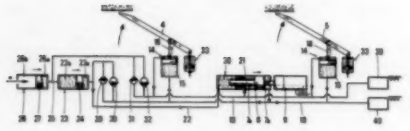
1. A retractable anchoring device adapted for rigidly posi-

tioning on an intermittent basis an instrument lowered into a cavity in the earth and connected to a surface installation by means of a cable, the device comprising:

(a) at least one pivotable anchoring arm adapted for being applied against the wall of said cavity and for being retracted therefrom;

(b) jack means associated with said at least one pivotable anchoring arm for causing said at least one pivotable anchoring arm to be applied against the wall of said cavity, said jack means comprising movable jack rod means connected to said at least one pivotable anchoring arm for causing movement thereof;

(c) an actuation system arranged inside said instrument associated with said jack means for actuation thereof, said actuation system comprising a piston assembly displaceably arranged in a first cylinder containing a liquid



therein, drive means for displacing said piston assembly to actuate said jack means, and limit means for limiting the forces applied to said at least one pivotable anchoring arm; and

(d) static pressure applying means for applying to said piston assembly the static pressure prevailing in said cavity, said static pressure applying means including a chamber of variable volume for containing a liquid whose pressure is maintained substantially equal to the static pressure prevailing in said cavity, and further comprising a second cylinder in communication with said first cylinder through an opening with a rod rigidly secured to said piston assembly and being slidably mounted within said opening, and said second cylinder being further connected to and in communication with said chamber of variable volume by means of a connecting line.

4,428,423

WELL SCREEN END FITTING ASSEMBLY AND METHOD OF MAKING SAME

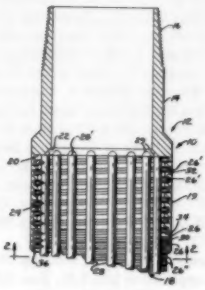
Raymond A. Koehler, Anoka, and Bernard M. Hanson, Excelsior, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed May 6, 1982, Ser. No. 375,782

Int. Cl.³ E21B *43/08*

U.S. Cl. 166—231 **7 Claims**

1. An improved well screen and end fitting assembly having enhanced tensile strength comprising a cylindrical well screen portion having a helically wound outer wire portion welded or otherwise affixed to a plurality of longitudinally extending rod portions, said outer wire portion being wound so as to define relatively narrow width slot portions of a first desired pitch for at least the major portion of its length and relatively wider width slot portions of a second desired pitch for a plurality of



revolutions at at least one end thereof; and a generally cylindrical end fitting member having a plurality of internal threads formed at one end thereof which are adapted to be threadedly placed in complementary engagement with the outer wire portion which defines said wider width slot portions of said well screen portion.

4,428,424

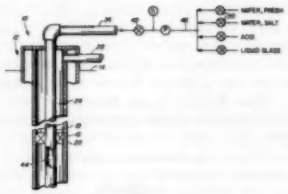
METHOD OF IMPROVING OIL/WATER PRODUCTION RATIO

James P. Lacy, Midland, and Edmond L. Bailey, Andrews, both of Tex., assignors to Waterchek, Inc., Midland, Tex.

Filed Jun. 11, 1982, Ser. No. 387,326

Int. Cl.³ E21B *33/138, 47/06*

U.S. Cl. 166—253 **18 Claims**



1. In a cased wellbore having perforations formed adjacent to a hydrocarbon producing formation thereof, wherein the formation produces excessive water through the perforations, the method of reducing the water production comprising the steps of:

(1) flowing a first treatment fluid which includes a dilute salt solution comprised of NaCl and CaCl along an isolated flow path down into the borehole, through the perforations, and out into the formation;

(2) flowing an inert spacer fluid behind the first treatment fluid;
(3) flowing a second treatment fluid comprised of a solution of sodium silicate along said isolated flow path and out into the formation;
(4) flowing an inert flushing fluid behind the silicate;
(5) repeating steps (1-4) while monitoring the surface pressure until the surface pressure begins to rise;
(6) flowing inert flushing into the borehole to flush the salt solution and the silicate solution from the borehole, out into the formation;
(7) flowing dilute HCl acid downhole into the formation after carrying out step (6), and then repeating the step of flowing an inert flushing fluid down the isolated flow path to displace the acid from the borehole;
(8) shutting in the wellbore until the silicate reacts with the acid and salt water to form a barrier in the form of a precipitant which prevents water flowing therethrough, and thereafter producing the wellbore.

4. A method of treating a hydrocarbon producing formation located downhole in a borehole, wherein the formation makes excessive water along with the hydrocarbons, comprising the steps of:
(1) flowing salt water along an isolated flow path, downhole and out into the formation; said salt water being selected from the group comprising NaCl and $CaCl_2$; and, thereafter;
(2) flowing a spacer fluid behind the salt water of step (1), said spacer fluid being inert respective to the salt water of step (1) and the soluble silicate of step (3); and, thereafter;
(3) flowing a soluble alkali silicate solution behind said spacer fluid and along said isolated flow path, and out into the formation; and thereafter displacing the silicate solution from the borehole by flowing another said spacer fluid behind the silicate solution; and,
(4) flowing dilute HCl downhole into the formation after carrying out step (3);
(5) shutting in the wellbore until the silicate reacts with the acid and salt water to form a barrier in the form of a precipitant which prevents water flowing therethrough, and thereafter producing the wellbore.

4,428,425

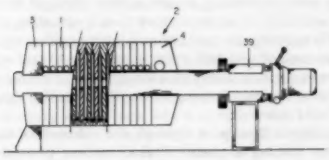
SINGLE PASS FILTRATION OF OIL OR GAS WELL COMPLETION FLUIDS

John A. Young, and Richard E. Munson, both of Baton Rouge, La., assignors to Baker Oil Tools, Inc., Orange, Calif.

Continuation of Ser. No. 300,654, Sep. 9, 1981, abandoned, which is a continuation of Ser. No. 189,676, Sep. 22, 1980, abandoned. This application Feb. 18, 1983, Ser. No. 467,160

Int. Cl.³ E21B *43/40*; B01D *25/12*

U.S. Cl. 166—267 **5 Claims**



5. A method for treating and removing at least about 99% of contaminate particulate matter of a size in excess of about one micron from fluid circulated into, through and out of a subterranean well, comprising the steps of:
(1) establishing a fluid flow path into, through and out of said well;
(2) circulating fluid in said flow path;
(3) introducing said circulated fluid under pressure into and through a vessel having a vertical planar expanse of filter cloth pre-treated with a filter aid, said filter cloth abutting a rigid supporting surface having a multiplicity of channels communicating with a peripheral channel;
(4) removing the filtrate from the peripheral channel; and
(5) circulating into said well the filtrate discharged from said vessel.

4,428,426

METHOD OF PLACING AND CONSOLIDATING A MASS OF PARTICULATE MATERIAL AND COMPOSITION FOR USE IN CARRYING OUT SAID METHOD

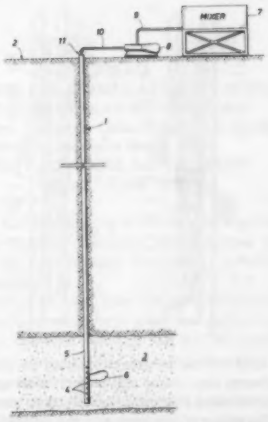
David R. Davies, Rijswijk, Netherlands; Edwin A. Richardson, Houston, Tex., and Adrianus M. P. M. Hagelaars, Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 18, 1981, Ser. No. 322,483

Claims priority, application United Kingdom, May 22, 1981, 8115811

Int. Cl.³ E21B *43/04*

U.S. Cl. 166—276 **6 Claims**



1. A process for emplacing and consolidating a mass of particles within a selected subterranean location comprising:
coating the particles with a polymerizable polyepoxide which is substantially free of any hardener or curing agent and is solid at the surface temperature near the well but becomes soft at the temperature of the selected subterranean location and, at that temperature, is reactive to yield a substantially cured solid epoxy resin when contacted by an aqueous liquid containing a substantially homogeneously distributed effective amount of a polyamino compound which is a curing agent for curing epoxy resin-forming components;
suspending the coated particles in an aqueous liquid and pumping the suspension into the well so that a mass of the particles is deposited within the selected subterranean location; and
contacting the particles in that mass with an aqueous liquid which contains a substantially homogeneously distributed effective amount of a polyamino compound which is a curing agent for epoxy resin-forming components, so that the softened coatings on the particles are converted to a substantially cured solid epoxy resin.

4,428,427

CONSOLIDATABLE GRAVEL PACK METHOD

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Filed Dec. 3, 1981, Ser. No. 328,740

Int. Cl.³ E21B *43/04*

U.S. Cl. 166—278 **1 Claim**

1. A method for gravel packing a washed-out cavity adja-

cent a borehole penetrating a subterranean formation comprising the steps of:

introducing into said borehole gravel particles suspended in a viscous fluid carrier, said gravel particles having a surface coating comprising a mixture of a polymerizable furfuryl novolak phenolic resin and catalyst;

allowing said gravel particles to fill the washed cavities; and thereafter

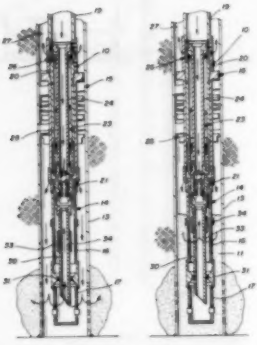
polymerizing the resin thereby bonding together the adjacent gravel particles to form a permeable, consolidated structure.

4,428,428

TOOL AND METHOD FOR GRAVEL PACKING A WELL

Kenneth E. Smyrl, Marrero, La., and Bobby G. Redd, Hobbs, N. Mex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 22, 1981, Ser. No. 333,511
Int. Cl.³ E21B *43/04, 34/08*
U.S. Cl. 166—278 **8 Claims**



1. In a tool for use in gravel packing an annulus in a well casing between the casing and a liner with upper and lower sand screen sections therein separated by an annular seal acting between the inside of the liner and the outside of a wash pipe which is telescoped into the liner for returning liquid from a gravel slurry pumped into the annulus and filtered at least initially through the lower sand screen before entering the wash pipe for return to the head of the well, wherein the improvement in said tool comprises, a port formed through the wash pipe above the seal, a differential area piston sleeve telescoped onto said wash pipe and being movable from a first position closing said port and toward a second position opening said port in response to a differential pressure of a preselected magnitude existing between the inside and outside of said wash pipe, and means for urging said sleeve into its closing position when said pressures inside and outside wash pipe approach equality.

4,428,429

METHOD FOR SWEEP IMPROVEMENT UTILIZING GEL-FORMING LIGNINS

Betty J. Felber, Tulsa, and Charles A. Christopher, Broken Arrow, both of Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed May 26, 1981, Ser. No. 267,123
Int. Cl.³ E21B *33/138, 43/22*
U.S. Cl. 166—294 **18 Claims**

1. A method of treating a subterranean oil bearing formation penetrated by at least one injection well, and having at least one highly conductive zone therein, comprising injecting into said zone an aqueous solution containing gel-forming water-soluble basic lignins, such that as said aqueous solution moves through said zone the pH of said aqueous solution is reduced causing said aqueous solution to gel over a substantial distance from said injection well to reduce the permeability of said zone.

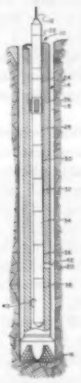
12. A method of treating a subterranean oil bearing formation penetrated by at least one injection well, and having at least one highly conductive zone therein, comprising injecting an aqueous solution containing gel-forming water-soluble basic lignins into said zone to reduce the permeability of said zone, and injecting an acidic gas into said zone to contact with said solution.

4,428,430

CHEMICAL METHOD AND APPARATUS FOR PERFORATING DRILL COLLARS

Jamie B. Terrell, I, and Jamie B. Terrell, II, both of Fort Worth, Tex., assignors to Gearhart Industries, Inc., Forth Worth, Tex.

Filed Jan. 13, 1981, Ser. No. 225,513
Int. Cl.³ E21B *43/11, 43/19*
U.S. Cl. 166—298 **12 Claims**



1. A method for increasing fluid flow circulation past the earth formations traversed by a well being drilled, the steps comprising:

(a) lowering a pressurable chemical reactant fluid jet stream type perforating means suspended from an electrical wireline through the drill pipe and drill collar of subsurface drilling apparatus and into a position within said drill collar where the fluid jetting orifice of said perforating apparatus is vertically positioned near the drill bit of said drilling apparatus;

(b) generating an actuating pressure within said perforating means;

(c) fixing said perforating means against vertical movement within said drill collar responsive to said actuating pressure;

(d) laterally moving the outlet of said jetting orifice against the inner sidewall of said drill collar in response to said actuating pressure to position said orifice for optimum reactive contact of chemical reactant flowing through said orifice against the face of said sidewall;

(e) perforating a flow port through the sidewall of said drill collar by forcing a chemical reactant out of said jetting orifice at high velocity in response to said actuating pressure into reactive contact with said drill collar sidewall; and

(f) circulating fluid through said flow port in addition to any fluid circulating through said drill bit.

7. Apparatus for perforating a hole through the thick metal wall of a conduit such as a flow port through the sidewall well drilling collar, said apparatus being provided as an elongated, generally tubular chemical reactant perforating tool adapted for connection to an electrical wireline, the combination comprising:

(a) an electrically actuated fluid pressure generator;

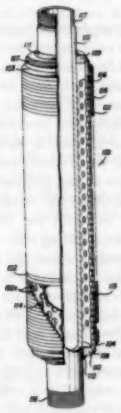
(b) slip means adapted to fix said tool against axial movement within said conduit in response to pressure applied from said generator;
(c) a liquid jet orifice means defined out of the side of said tool and adapted to direct a liquid jet stream in a single direction;
(d) a quantity of liquid chemical reactant contained within said tool and adapted to be moved forcefully out from said jet orifice in response to pressure applied from said generator; and
(e) lateral displacement means adapted to move said tool to address said jet orifice and said liquid jet stream directly toward the inside wall of said conduit in response to pressure applied from said generator.

4,428,431

PERFORABLE SCREEN DEVICE FOR SUBTERRANEAN WELLS AND METHOD OF PRODUCING MULTI-LOBE ZONES

Darrell J. Landry, New Orleans, and James E. Porter, Lafayette, both of La., assignors to Baker International Corporation, Orange, Calif.

Filed May 14, 1981, Ser. No. 263,801
Int. Cl.³ E21B *43/114, 43/08*
U.S. Cl. 166—298 **14 Claims**



1. A method of completing and producing a subterranean well having a plurality of production lobes within at least one productive zone around the bore of said well, comprising:
(1) introducing into said well a gravel packing assembly carried on a tubular conduit;
(2) gravel packing said productive zone and each of said lobes with said assembly by introducing through said gravel packing assembly and within said tubular conduit a gravel packing carrier fluid having particulate matter therein and circulating said fluid within the bore of said well within said production zone to deposit the particulate matter within the interior of said well bore immediate each of said lobes;
(3) positioning across each lobe a screen device carried on said tubular conduit, comprising: an elongated outer housing having a plurality of flow passageways extending therethrough; an inner perforable cylindrical mandrel having upper and lower ends, at least one of said ends being securable with a conduit member of said tubular conduit, said inner mandrel longitudinally extending through the interior of said housing; a central passageway in said mandrel communicable with said tubular conduit for transmission of fluid; and means for securing said mandrel against movement relative to said housing, said screen device prior to perforation of said mandrel preventing fluid flow between said flow passageways and the central passageway of said mandrel, said screen device subsequent to perforation of said mandrel permitting transmission of fluid between said flow passageways, said central passageway and said tubular conduit;
(4) introducing within said tubular conduit a jet-action perforation gun, said gun being carried through said conduit on an auxiliary conduit;
(5) positioning said gun within the interior of one of said screen devices;
(6) activating said gun to perforate said mandrel whereby production fluid within the lobe adjacent to the screen device with the mandrel perforated by said jet-action may be transmitted through the flow passageways and the central passageway of said perforated screen device and through said tubular conduit, the flow of said produced fluid thereby not being substantially co-mingled with production fluid within all other lobes within said well.

4,428,432

METHOD FOR STIMULATING SILICEOUS SUBTERRANEAN FORMATIONS

Avtar S. Pabley, Littleton, Colo., assignor to Smith International, Incorporated, Newport Beach, Calif.

Filed Apr. 16, 1980, Ser. No. 140,737
Int. Cl.³ E21B *43/27*
U.S. Cl. 166—302 **15 Claims**

1. A process for the acidizing or acid-fracturing of a siliceous subterranean formation containing hydrocarbons comprising injecting into the subterranean formation a crosslinked acid polymer comprising:
a polysaccharide selected from the group consisting of carboxymethyl hydroxypropyl guar and carboxymethyl hydroxyethyl cellulose wherein the polysaccharide is employed in an amount sufficient to gel the acid in the presence of a crosslinking agent;
an acid mixture comprising from about 1 to about 15 weight percent of hydrochloric acid and from about 0.2 to about 6 weight percent of hydrofluoric acid; and
a crosslinking agent which is a water soluble polyvalent metal salt wherein the metal is selected from the group consisting of zirconium and hafnium, wherein the crosslinking agent is present in an amount of between about 120 and about 1680 pounds per 1,000 gallons of acid.

4,428,433

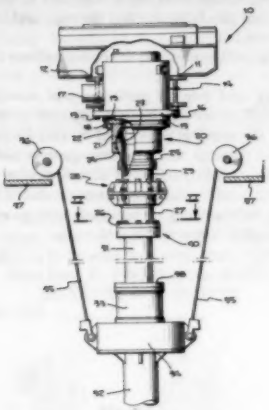
TELESCOPIC JOINT UPPER TUBE RETAINER METHOD

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Sep. 28, 1981, Ser. No. 306,443
Int. Cl.³ E21B *17/07*
U.S. Cl. 166—339 **3 Claims**

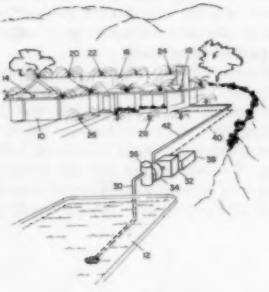
1. A method of assembling the upper tube of a telescopic joint to a suspension member attached to a floating vessel over a subsea well wherein the telescopic joint comprises part of a riser connection between the vessel and well, the method comprising the steps of:
fitting a split internally threaded locking nut about an upper externally threaded portion of said upper tube;

landing a solid support ring about said split nut by raising said solid ring upwardly about said split nut by pulling said



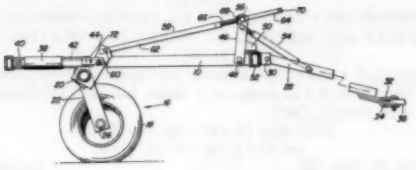
solid ring upwardly against said suspension member with said split nut therebetween.

4,428,434
AUTOMATIC FIRE PROTECTION SYSTEM
Jonathon L. Gelaude, 15708 Mayall St., Granada Hills, Calif. 91344
Filed Jun. 19, 1981, Ser. No. 275,264
Int. Cl.³ A62C *35/00*
U.S. Cl. 169—13 **6 Claims**



6. An automatic fire protection system for a structure comprising: sprinkler means on said structure, a water supply for said spinkler means, pump means for pumping water from said water supply to said sprinkler means, power means to operate said pump means, automatic temperature sensors affixed to said structure, anticipating electronic means adapted to initiate the power means in response to any of the following occurrences: a predetermined temperature being sensed by the automatic temperature sensors, a predetermined rapid rise in temperature wherein the rate of change of temperature initiates the power means, or a radiant heat reading, wherein the anticipating electronic means comprises a differentiating amplifier whose output is proportional not only to the level of input so that a rapid rise of temperature causes the output of the differentiating amplifier to swing to a level equivalent to one higher than the actual temperature which will initiate the power means if the preselected level is reached, a timer function which turns on a high flow rate of water for a preselected time and automatically reduces the flow rate of water, and in which the anticipating electronic means is adapted to change the flow rate of water from a low flow back to the high flow upon sensing the preselected temperature, rate of change of temperature or radiant heat reading.

4,428,435
AGRICULTURAL IMPLEMENT WITH HITCH CONTROL
Kevin L. Hubbard, Orion, and Robert R. Roth, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed May 10, 1982, Ser. No. 376,358
Int. Cl.³ A01B *63/22*
U.S. Cl. 172—328 **1 Claim**



1. A ground-working implement having a fore-and-aft frame including front and rear ends, wheel means disposed below the frame rearwardly of the front end, cranked axle means journaling the wheel means and including an arm rockable on the frame, power means connected between the frame and cranked axle means arm for raising and lowering the frame between raised and lowered modes, a hitch member connected to the front end of the frame on a transverse axis and extending forwardly for connection to and support on a draft vehicle for vertical movement relative to the vehicle, and linkage means operatively connected between the hitch member and the cranked axle means for controlling relative movement between the frame and hitch member about the aforesaid axis, characterized in that the linkage includes a lever arm having upper and lower terminal ends and pivoted on a transverse axis at its lower terminal end to the front end of the frame, stop means cooperative between the frame and lever to limit forward movement of the lever in the raised mode of the frame, a compression link connected between the upper end of the lever arm and the arm of the cranked axle means and a second compression link connected between the hitch member and a portion of the lever arm above its pivot to the frame, the connection of the first link to the arm of the cranked axle means being so constructed as to enable only relative pivoting between said link and arm about a transverse axis, the connection of the first link to the lever arm including a one-way lost-motion device having an abutment effective to engage the lever arm only during the raised mode of the frame so as to lock out relative movement between the frame and cranked axle means and also between the frame and hitch member about the aforesaid transverse axes.

4,428,436
SEED TRENCH DIGGER WITH INDEXING STRUCTURE
Russell D. Johnson, 2308 W. 14th Ave., Spokane, Wash. 99204
Filed Feb. 18, 1983, Ser. No. 467,771
Int. Cl.³ A01B *1/02*
U.S. Cl. 172—372 **4 Claims**

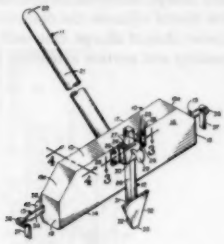
1. A tool for forming a seed trench at a spaced distance from an indexing indicia of some lineal extent comprising, in combination:

an elongate, rigid body having a substantially planar bottom and at least two opposed vertical sides;

an elongate handle extending angularly from the medial part of a first one of said vertical sides of said body with an obtuse included angle therebetween;

at least one indexing member providing an elongate body

slidably extensible horizontally outwardly from at least one of said vertical sides of the tool body in a direction generally parallel to that side with means to aid in manual manipulation thereof, means to follow some indexing indicia and means of releasably positioning the indexing element relative the body; and



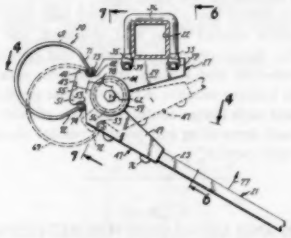
a spade member, carried on the second vertical tool body side including a bracket mechanically communicating with the body and vertically adjustably supporting an elongate spade shank carrying a truncated triangular spade in its lowermost portion and means for vertically adjustably positioning said spade below the bottom of said tool body.

4,428,437

MOUNT ASSEMBLY INCLUDING STRUCTURE TO EFFECT SUBSTANTIALLY CONSTANT BIASING FORCE

Richard W. Steinberg, Mankato, Minn., assignor to Hiniker Company, Mankato, Minn.

Filed Mar. 9, 1981, Ser. No. 241,498
Int. Cl.³ A01B *21/04, 61/04*
U.S. Cl. 172—547 **54 Claims**



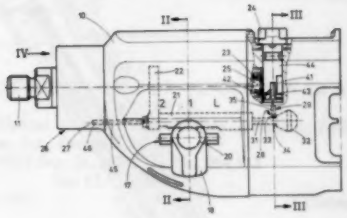
1. A mount assembly for connecting a movable member to a support comprising: a first member, means for attaching the first member to the support, a second member for supporting the movable member, means pivotally connecting the first and second members allowing the second member to move about an axis between a first position and a second position, and biasing means mounted on the first and second members to bias the second member to the first position, said biasing means including split ring spring means having a first end mounted on the first member and a second end mounted on the second member, said second end moving relative to said axis on movement of the second member to vary the split ring spring means torque arm relative to the axis so as to maintain a substantially constant biasing force on the second member during movement thereof between the first and second positions, said first member having arcuate outwardly directed ribs and said second member having arcuate outwardly directed ribs, said means pivotally connecting the first and second members including a cylindrical member, said arcuate ribs of the first and second members surrounding opposite portions of the cylindrical member, cap means surrounding said ribs and engageable with opposite ends of the cylindrical member, and means holding the cap means in engagement with the cylindrical member.

4,428,438

PERCUSSIVE DRILL WITH SAFETY INTERLOCK FOR REVERSING GEAR

Peter Holzer, Solothurn, Fed. Rep. of Germany, assignor to Scintilla AG, Solothurn, Switzerland

Filed Jul. 3, 1980, Ser. No. 165,801
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932470
Int. Cl.³ B23B *45/16*; B25D *17/10*
U.S. Cl. 173—48 **23 Claims**



1. A motor-driven combination rotary tool having a casing, a motor therein, a working spindle mounted thereon carrying a bit-holding chuck, manually settable drive-reversing means for causing said spindle to be driven by said motor either in normal right-hand rotation or in the opposite left-hand rotation, and equipped or designed to power optionally usable means for operating detachable auxiliary tools which are compatible only with right-hand rotation of said spindle and also comprising the improvement which consists in that:

a mechanical interlock device is provided which is mechanically coupled with said drive reversing means independently of the application of rotary force to said spindle for blocking and thereby rendering inoperative said optionally usable auxiliary tool operating means when said drive-reversing means are set for left-hand rotation of said spindle and for blocking, and thereby preventing left-hand rotation of said spindle, so long as said optionally usable auxiliary tool operating means are mechanically coupled to said spindle.

4,428,439

ADJUSTABLE, PORTABLE, HAND-HELD IMPACTOR

Jack Moreno, Bethel, Conn., assignor to Blackstone Industries, Inc., Bethel, Conn.

Filed Jan. 18, 1982, Ser. No. 340,190
Int. Cl.³ B23B *45/16*
U.S. Cl. 173—118 **11 Claims**

1. A hand-holdable impacting tool for receiving externally generated torque and generating reciprocating axial hammering motion at the tool tip, said tool comprising:

A. an outer housing,

B. an elongated spindle mounted within the housing for rotational movement, responsive to the externally generated torque delivered to said housing;

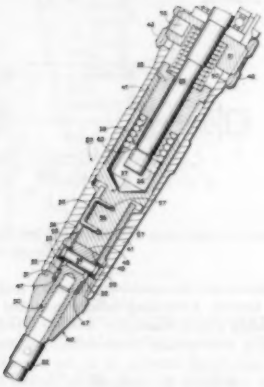
C. a cam follower rigidly mounted to the spindle and extending therefrom substantially perpendicularly to the central axis of the spindle;

D. a cam member comprising a helical coil spring

a. mounted in the housing for axial sliding movement relative thereto, with biassing means producing a force acting upon the cam member to produce movement in a first axial direction,

b. having a central axis substantially concentric with the central axis of the spindle,

c. having a cam surface formed from one end coil of the coil spring, and comprising
1. a substantially smooth, continuous, ramped sloping surface extending to the terminating end of the coil spring, and
2. a substantialy flat surface forming the terminating end of the coil spring, providing an abrupt transition from the high point of the ramped, sloping surface to the low point thereof, and
d. having the cam surface in sliding frictional engagement with the cam follower with movement of the cam follower on the cam surface causing said cam member to move in the opposed, second axial direction; and



E. an anvil tip
a. mounted in and extending from the housing and axially movable relative thereto, and
b. operatively connected to be impelled by the axial movement of the cam member in at least one of its directions,

whereby the rotational movement of the cam follower on the biassed coil spring cam member causes the cam member to move axially forwardly and rearwardly in a continuous, reciprocating manner which is cooperatively associated with the movement of the anvil tip to produce the desired reciprocating hammering effect.

4,428,440

PERFORATING APPARATUS ENERGY ABSORBER AND EXPLOSIVE CHARGE HOLDER

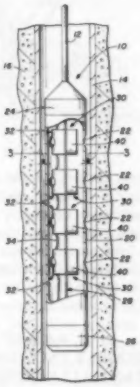
William A. McPhee, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 14, 1981, Ser. No. 292,969
Int. Cl.³ E21B *43/17*
U.S. Cl. 175—4.6 **5 Claims**

1. In a well perforating apparatus adapted for producing perforations in a well bore an apparatus having an elongated tubular perforating gun body within which is contained an explosive shaped charge with an external case mounted in a carrier such that the detonation end portion of the explosive shaped charge is located on one side of the carrier and the forward discharge end portion thereof is on the opposite side with said discharge end portion being larger in diameter than said detonation end portion and connected by an annular radial abutment that rests against said carrier for firing along a selected perforating axis transverse to said elongated tubular member and having a detonating cord positioned at the detonation end portion of the explosive shaped charge, an improvement comprising:

an explosive charge shield positioned in substantially surrounding relation to the major portion of the detonating end portion of said explosive charge with mount means securing said explosive charge shield in substantially rigidly mounted relation to said explosive shaped charge such that upon detonation of said explosive shaped charge a portion of the energy of the explosion is absorbed by said explosive charge shield as it is deformed in order to reduce the impact effects of the shaped charge's explosive forces on the perforating gun body;

said explosive charge shield has an aperture therethrough at the portion therof adjacent the detonating end portion of said explosive shaped charge case with a portion of said case detonating end portion extending through said aperture;



said well perforating apparatus includes a detonating cord positioned over the end of said detonating end portion and passed between the edge of said aperture and said detonating end portion of said case; and

said mount means has a recess around said case discharge end portion spaced from said abutment and inwardly extending flange on each opposing end portion of said shield wherein said flanges are each cooperatively engaged in locking relation in opposed side portions of said recess and each flange contacts the side of said carrier on which said detonation end portion resides to secure said case to said carrier.

4,428,441

METHOD AND APPARATUS FOR REDUCING THE DIFFERENTIAL PRESSURE STICKING TENDENCY OF A DRILL STRING

Thomas B. Dellinger, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

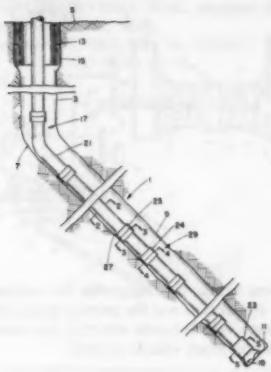
Continuation-in-part of Ser. No. 26,844, Apr. 4, 1979, Pat. No. 4,246,975. This application Jan. 8, 1981, Ser. No. 223,464
The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.
Int. Cl.³ E21B *7/08, 17/02*
U.S. Cl. 175—61 **6 Claims**

1. A method of drilling a deviated wellbore into the earth's crust by a rotary drilling technique wherein a drill string is used to advance a drill bit into the earth's crust and a drilling fluid is circulated down the drill string and returned from the wellbore in the annulus formed about the drill string, comprising:

(a) drilling a vertical first portion of said wellbore into the earth's crust from a surface location to a kick-off point at about the lower end of said first portion by rotating and advancing a drill string and drill bit into said earth's crust;
(b) initiating a deviated second portion of said wellbore at said kick-off point;

(c) withdrawing said drill string and drill bit from said vertical first portion of said wellbore;

(d) running into said vertical first portion of said wellbore a specialized drill string for drilling said deviated second portion of said wellbore, said specialized drill string being comprised of elements having non-circular cross-sectional shapes, said drill string having a drill bit at the lower end thereof; and



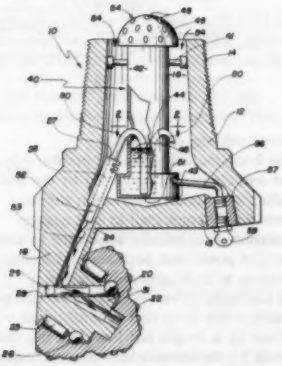
(e) rotating said specialized drill string to drill said deviated second portion of said wellbore, whereby the reciprocating action of said non-circular elements tends to stir earth cuttings and to permit said drilling fluid to contact and move earth cuttings to thereby mitigate differential sticking of said specialized drill string in said wellbore.

4,428,442

ROCK BIT LUBRICATION SYSTEM

Stephen C. Steinke, Miami, Ariz., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 17, 1982, Ser. No. 378,965
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—228 **4 Claims**



1. A rotary rock bit for dry rock drilling comprising:

a bit body forming a first opened pin end, said body further forming a chamber thereby, said chamber is in communication with said opened pin end of said body for receiving compressed fluid directed into said pin end of said body,

at least one roller cutter cone rotatably carried by a journal extending from a second portion of said bit body,

at least one fluid passage channel formed in said body, a first opened end of said channel communicates with the interior of said chamber, a second end of said channel communicates with bearing surfaces formed between said at least one cutter and its respective journal, at least one conduit tube forming first and second opened ends, a first end of said conduit tube is positioned in said first opened end of said channel, the second opened end of said conduit tube protrudes into the interior of said chamber to receive said compressed fluid directed into said chamber through said pin end of said body, and

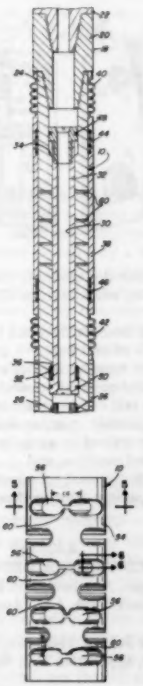
lubrication means within said chamber, said lubrication means directs lubricant through said opened end of said conduit tube into said fluid passage channel, said lubricant being entrained with said compressed fluid as said fluid passes into said bearing surfaces to cool and lubricate said bearing surfaces.

4,428,443

SHOCK ABSORBING TOOL FOR CONNECTION TO A DRILL COLUMN

Stephen E. Oliphant, Arvada, Colo., assignor to Stability Drilling Systems, Inc., Denver, Colo.

Filed Sep. 21, 1981, Ser. No. 304,112
Int. Cl.³ E21B *17/07*
U.S. Cl. 175—321 **6 Claims**



1. A shock absorbing tool adapted for use in a drillstring including a drill bit, comprising:

a cylindrical, resilient member having an outer surface and a plurality of open sections formed therein, said open sections being spaced from each other about the periphery of said cylindrical member, said cylindrical member having a first slot formed therein and interconnecting a first pair of

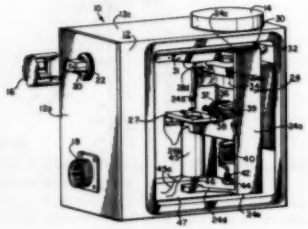
open sections, the width of said first slot at said outer surface of said member in the absence of a compressive force applied to said member being at least about 0.03 of an inch, said resiliency of said member being of a kind wherein said first slot closes upon application of a predetermined compressive force applied to the tool while portions of said first pair of open sections remain open upon application of the predetermined compressive force, said resiliency of said cylindrical member being of a kind wherein said first slot resumes its initial open state upon removal of the predetermined compressive force, said cylindrical, resilient member being formed of a material and being of a configuration wherein said member substantially operates below its elastic limit, said member acting to reduce both torsional and axial dynamic loading through the closing of said first slot.

4,428,444

VARIABLE DAMPING SUBASSEMBLY FOR WEIGH CELL

Vernon Whittaker, King of Prussia, and Richard Kayros, Bristol, both of Pa., assignors to American Manufacturing Company, Inc., King of Prussia, Pa.

Filed Feb. 12, 1982, Ser. No. 348,492
Int. Cl.³ G01G *23/08*
U.S. Cl. 177—187 **20 Claims**



1. A variable dash-dot assembly comprising:
(a) a dash-pot cup adapted to be filled with a damping material,
(b) a perforated member disposed for movement within and along the axis of said cup,
(c) an adjustable member having a substantially planar portion adjustably coupled to said perforated member for movement in said cup in unison with said perforated member, said adjustable member being constructed and arranged to be rotated so as to be adjustably spaced from said perforated member, and
(d) means coupled to said (c) member for moving the latter to selected spacings from said perforated member.

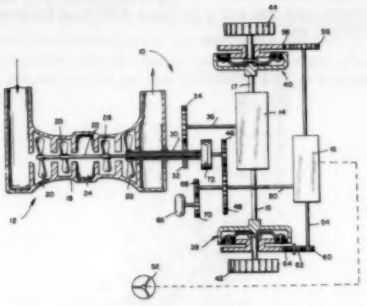
4,428,445

TRACKED VEHICLE DRIVE ASSEMBLY

Franz X. Zaunberger, Augsburg, Fed. Rep. of Germany, assignor to Zahnraderfabrik Renk A.G., Augsburg, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,629
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034816
Int. Cl.³ B62D *11/16*
U.S. Cl. 180—6.44 **10 Claims**

1. A drive assembly for a tracked vehicle having gearing means for propulsion of the vehicle and a steering unit for steering the vehicle, the drive assembly comprising a multiple shaft gas turbine engine, the engine including a working wheel output shaft and a compressor shaft, power input means for operatively interconnecting the gearing means to the engine working wheel output shaft and power input means for permanently interconnecting the steering unit to the compressor shaft and means for selectively drivingly interconnecting the steering unit and the output shaft, the steering unit being driven solely by the compressor shaft during normal engine operation, the steering unit and output shaft interconnecting



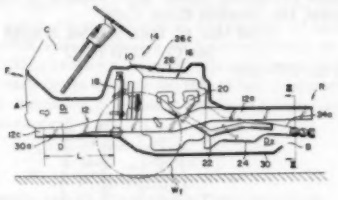
means being selectively engageable for continued steerability when the engine fails and the gearing means drives the output shaft through vehicle inertia whereby the steering unit will be driven for continued vehicle control.

4,428,446

MOTOR VEHICLE EQUIPPED WITH ENGINE NOISE EMISSION PREVENTING DEVICE

Akira Kimura, Kawasaki; Masao Ishihama, and Yoshikazu Hayakawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 28,938, Apr. 11, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,061
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—54 A **15 Claims**



1. A motor vehicle, comprising:
a vehicle body including lower opposite side wall sections;
a power unit elastically supported by the vehicle body and including an internal combustion engine;
a radiator fluidly connected to said engine;
a transmission mechanically connected to said engine;
said radiator positioned between said lower opposite wall sections so as to be generally vertical;
a sound insulating cover located below said power unit and extending away from said radiator in the vehicle forward direction by a length not less than the distance $(b') /\pi$, where (b') is the distance between said lower opposite side wall sections of said vehicle body in the direction of the width of said radiator, said sound insulating cover further extending away from said radiator in the vehicle rearward direction at least to the rearward end of said transmission, said radiator positioned rearwardly from the front of said vehicle by at least the length (L); and
means for securely connecting said sound insulating cover with said vehicle body
said vehicle body, sound insulating cover and connecting

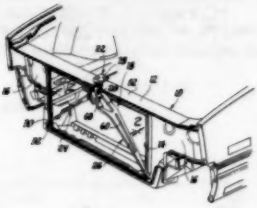
means constituting a noise insulating duct, generally longitudinal within which said radiator, said power unit and said transmission are longitudinally positioned in series so as to reduce engine noise emitted outside of the vehicle.

4,428,447

VEHICLE FRONT END STRUCTURE

Donald E. Malen, Lathrup Village, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1982, Ser. No. 368,901
Int. Cl.³ B62D 25/08
U.S. Cl. 180—68 R 2 Claims



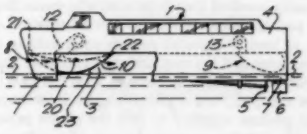
1. A vehicle front end structure comprising, in combination, a radiator support including a rectangularly shaped portion defining a generally rectangularly shaped air access opening, an inverted generally V-shaped brace including a pair of divergent legs and an apical portion located across said opening, each leg of said brace being secured to a respective lower corner of said rectangularly shaped portion and the apical portion of the brace being secured to the upper side of said rectangularly shaped portion, means on the apical portion of the brace providing an opening therethrough and a striker portion for a hood latch member adjacent the opening, said brace being formed of a pair of sheet metal members, each providing one of the legs thereof, with the opening being provided by one of the members and the striker portion by the other of the members.

4,428,448

FLUID-CUSHION SUPPORTED APPARATUS

Edward G. Tattersall, and Anthony J. English, both of Southampton, England, assignors to Vosper Hovermarine Limited, England

Filed Feb. 25, 1982, Ser. No. 352,303
Claims priority, application United Kingdom, Mar. 13, 1981, 8107935
Int. Cl.³ B60V 1/16
U.S. Cl. 180—128 11 Claims



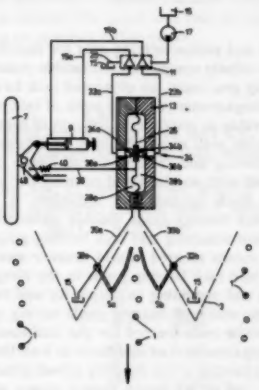
1. A fluid-cushion supported apparatus provided with an inflatable flexible skirt system, the system comprising: a row of filamentary support members disposed in laterally spaced relationship, with end portions attached to the apparatus; and, flexible sheet materials supported by and depending from the support members so as to form interconnected loops each of which hangs downwardly between the filamentary support members, the loops also being curved longitudinally between the end portions of the filamentary support members.

4,428,449

COMPARATOR FOR THE CONTROL CIRCUIT OF AN AUTOMATIC STEERING INSTALLATION

Armin Lang, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/DE80/00057, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 27, 1981, PCT Pub. No. WO80/02540, PCT Pub. Date Nov. 27, 1980
PCT Filed May 16, 1980, Ser. No. 247,298
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919712
Int. Cl.³ B62D 5/06
U.S. Cl. 180—131 10 Claims



1. A comparator for an automatic steering system wherein said system comprises feelers for scanning guide lines such as rows of plants and said comparator comprises pressure chamber means having a member movable by a difference in pressure in said chamber means to operate valve means for actuation of motor means for steering a vehicle wheel;

said difference in pressure being responsive to operation of said feelers by guide lines and said comparator including mechanical actuating means whereby movement of said member is also responsive to change in wheel direction operating said valve means for wheel centering;

the improvement which comprises:

said chamber means comprising a pair of chambers (**28***a*, **28***b*) said movable member (**26**, **26'**) being operatively related to the chambers for exposure to the pressures therein and being responsive thereto for movement including a respective means (**50***a*, **50***b*, **52***a*, **52***b*) for feeding pressure fluid through said chambers comprising respective inlets (**52***a*, **52***b*) and outlets **50***a*, **50***b*);

said valve means comprising valves (**34***a*, **36***a*, **34***b*, **36***b*) disposed to normally pass said flow through a respective pressure chamber;

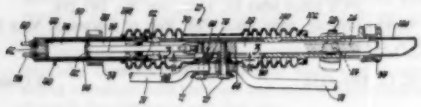
pressure control means for said pressure chambers wherein each chamber outlet has a variable throttle valve (**32***a*, **32***b*) connected for flow from a respective chamber and operable by a respective feeler (**5***a*; **5***b*) to throttle flow for increasing pressure in a respective chamber creating a pressure difference between chambers and thereby effecting movement of said movable member to operate said valves for actuation of said motor means effecting vehicle wheel steering; said mechanical actuating means being resiliently coupled to said movable member whereby a change in direction of a vehicle wheel mechanically moves said movable member to operate said valves producing centering of said wheel by said motor means without operation of said feelers.

4,428,450

RACK AND PINION STEERING GEAR

Craig A. Stenstrom, Saginaw; Alan D. Holzhausen, Frankenmuth, and Thomas R. Stepp, Jr., Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 15, 1982, Ser. No. 418,449
Int. Cl.³ B62D 5/06
U.S. Cl. 180—148 4 Claims



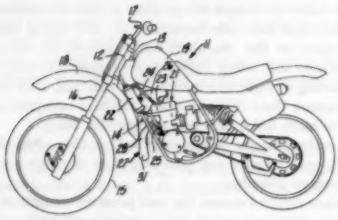
1. A rack and pinion steering gear for steering the dirigible wheels of a vehicle comprising a rotatable pinion gear providing a steering gear input, an elongated rack having rack teeth in meshing engagement with the teeth of said pinion gear and linearly movable in response to rotation of said pinion gear, a housing having wall means defining an internal passage way slidably receiving said rack, said wall means of said housing being formed with an elongated opening therein providing a track, said track having stop shoulders at opposite ends thereof, a rack bearing guide slidably mounted in said track, fastener means attaching said rack bearing guide to said rack, and tie rod means secured to said fastener means operatively connecting said rack bearing guide to the dirigible wheels of said vehicle and providing an output for said rack and pinion steering gear, said rack bearing guide having yieldable cushions at opposite ends thereof for the cushioned engagement with said stop shoulders of said track to limit the travel of said rack and the turning of the dirigible wheels attached to said tie rod means, and spring finger runner means attached to the opposite sides of said rack bearing guide for engaging a portion of said track to provide for the lash-free sliding fit of the rack bearing guide in said track.

4,428,451

COOLING SYSTEM FOR A MOTORCYCLE

Yusaku Yamaoka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 23, 1982, Ser. No. 351,447
Claims priority, application Japan, Feb. 25, 1981, 56-26351
Int. Cl.³ B60K 11/04, 13/04, 15/02
U.S. Cl. 180—229 18 Claims



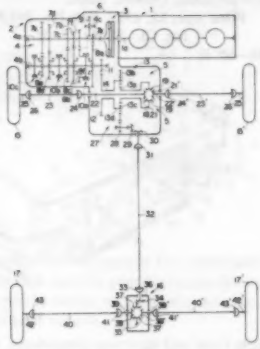
1. In a motorcycle having a frame assembly comprising a down tube, an engine supported by said frame assembly, a heat exchanger for cooling a liquid of the engine, and an exhaust pipe, the improvement comprising said heat exchanger being positioned on one side of said down tube, and including an exhaust expanison chamber positioned in part contiguous to the other side of said down tube, said exhaust pipe having a first portion extending downwardly from said engine toward the ground and a second portion extending upwardly from said first portion toward said exhaust expansion chamber and communicating with said exhaust expansion chamber.

4,428,452

FOUR-WHEEL-DRIVE SYSTEM FOR VEHICLE

Akihiko Muraoka, Yokohama, and Kunihiko Suzuki, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 31, 1981, Ser. No. 249,419
Claims priority, application Japan, Apr. 25, 1980, 55-55732
Int. Cl.³ B60K 5/04, 17/34
U.S. Cl. 180—249 8 Claims



1. A four-wheel-drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising

a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;

a power transmission gear unit including transmission input and output shafts each having an axis of rotation substantially parallel with the axis of rotation of the output shaft of said power unit, and gears mounted on said transmission input and output shafts and arranged to be capable of selectively producing a plurality of ratios between the speeds of rotation of the transmission input and output shafts;

a speed reduction gear with which the transmission output shaft is held in driving engagement for driving the reduction gear to rotate about an axis of rotation thereof;

a first final reduction gear unit including a differential gear casing and gears arranged to split an input driving power into two output components to be transmitted to one of said two pairs of road wheels;

a second final reduction gear unit including gears arranged to split an input driving power into two output components to be transmitted to the other of said two pairs of road wheels; and

a planetary gear assembly including an externally toothed sun gear rotatable about an axis of rotation thereof, an internally toothed ring gear coaxially encircling said sun gear and rotatable about the axis of rotation of the sun gear, at least two planet pinions each held in mesh with the sun gear and the ring gear and rotatable about an axis of rotation substantially parallel with the axis of rotation of the sun gear, and a pinion carrier interconnecting the planet pinions together so that the planet pinions are revolvable together around the axis of rotation of the sun gear, wherein said speed reduction gear is held in driving engagement with said pinion carrier, one of the sun gear and the ring gear being in driving engagement with one of said first and second final reduction gear units and the other of the sun and ring gears being in driving engagement with the other of the first and second final reduction gear unit,

wherein said speed reduction gear has its axis of rotation substantially in parallel with the input and output shafts of said transmission gear unit; wherein the sun gear, the ring

gear and the pinion carrier of said planetary gear assembly have their common axis of rotation substantially in line with the axis of rotation of said speed reduction gear; and wherein the differential gear casing of said first final reduction gear unit has its common axis of rotation substantially in line with the axis of rotation of said speed reduction gear.

4,428,453

EXHAUST SILENCES FOR INTERNAL COMBUSTION ENGINES

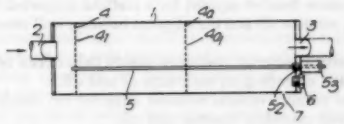
Yat C. Yuen, 70 Lee Garden Rd., Flat L, 17th Fl., Hong Kong, Hong Kong, and Kin S. Yuen, 54 Ross Hall Bldg. South, Piscataway, N.J. 08854

Filed Apr. 20, 1982, Ser. No. 370,058

Claims priority, application United Kingdom, Apr. 28, 1981, 8113034

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—231 **15 Claims**



1. A silencer for the exhaust of an internal combustion engine, comprising:

a cylindrical chamber through which the exhaust gases are directed,

at least one perforated baffle plate within the chamber and in scraping contact with the chamber inside surface,

means for moving the at least one baffle plate longitudinally of the chamber to scrape deposited material from the inside surface thereof, and

a plugged aperture communicating with the chamber which can be selectively unplugged to allow the deposited material scraped from the inside chamber surface to be expelled therethrough.

4,428,454

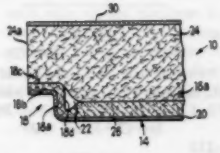
ACOUSTICAL PANEL CONSTRUCTION

Raymond W. Capaul, Rte #3, Wildwood Dr. Box 643, Aurora, Ill. 60504, and Barry D. Capaul, 6010 Oakwood, Apt. 4D, Lisle, Ill. 60532

Continuation-in-part of Ser. No. 305,286, Sep. 24, 1981. This application Sep. 2, 1982, Ser. No. 414,298

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—290 **13 Claims**



1. An acoustical panel construction adapted to be edge supported as a unit on a grid system, comprising: a preformed body portion which defines the exposed surface area of the panel, said body portion being formed of an acoustical material having a preselected density and thickness and having a facing material on the outer surface thereof for enhancing the rigidity, dimensional stability and structural strength of the body portion, a layer of an acoustical material having a preselected density and thickness carried on the body portion, the density and thickness of said layer being such as to enable it to be carried on the body portion without causing the body portion to sag or warp and to provide in cooperation with the acoustical material of the body portion sufficient sound absorption capabilities to the panel to meet the predetermined acoustical demands of substantially any room in which the panel is installed, and distinctly defined edge portions integrally joined to the margins of the panel, said edge portions extending laterally outwardly along the margins of the panel and being defined by the side margins of the body portion and said layer of acoustical material, said side margins, having a preselected density and thickness such that when the edge portions are positioned on the horizontal panel supporting surface of a rail, or the like, of a grid system they will by themselves have sufficient structural strength to support the panel as a unit on a grid system without sagging or warping of the panel.

4,428,455

EMERGENCY DESCENT DEVICE

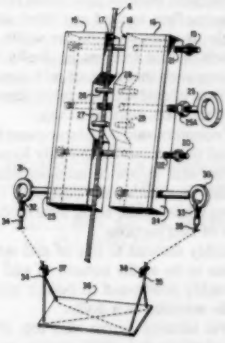
Armand Dale, 3100 Carling Ave., Suite 1121, Nepean, Ontario, Canada K2B 6J6

Filed Apr. 22, 1982, Ser. No. 370,613

Claims priority, application Canada, May 6, 1981, 376970

Int. Cl.³ A62B *1/10*

U.S. Cl. 182—7 **18 Claims**



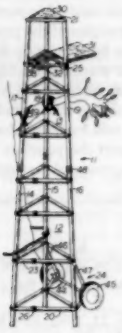
1. An emergency descent device comprised of a pair of friction members having cooperatively shaped adjacent convoluted surfaces, means for adjusting the space between the surfaces, first cable guide means extending from one member to the other on one side thereof for retaining a cable between the convolutions of said surface, and second cable guide means fixed to one member and and extending from said one member to the other on the other side thereof when the surfaces are a first predetermined distance apart in which the convolutions are substantially enfolded, and extending from said one member toward, but not as far as the other when the convolutions are a second predetermined distance apart in which the convolutions are not substantially enfolded, whereby said cable can be slipped between said surfaces and between the first and second cable guide means when the surfaces are said second distance apart, and be retained therebetween when the surfaces are adjusted to said first distance apart, said first cable guide means being in the form of a pair of dowel shaped members fixed adjacent mutually opposite ends on said one side of one friction member and directed toward the other friction member, and slideably passing through holes in the other friction member, whereby the lateral positions of the friction members are fixed relative to each other as the friction members are adjusted in distance therebetween, and further including means attached to the friction members for suspending a body.

4,428,456

LOOKOUT CONVERTIBLE TO A COMPACT DOLLY

Earl C. Rohde, 327 Green, Muscatine, Iowa 52761

Filed Feb. 4, 1983, Ser. No. 464,034
Int. Cl.³ E04G 1/24; A01M 31/02
U.S. Cl. 182—20 4 Claims



1. A lookout convertible to a compact dolly comprising:

a tower having a plurality of similarly shaped gradually tapered elongated sections joined end to end, each of said sections having first, second and third sides as an equilateral triangle in cross section, the width of each of said sides of each of said sections gradually decreasing from bottom to top such that each of said sections individually and said tower of said sections while joined are gradually tapered inward from bottom to top,

a plurality of couplers, said couplers connecting said sections together end to end and being easily loosened to separate said sections, said separated sections being easily nested longitudinally one within the other, the overall length of said sections while nested being little more than the length of any one of said sections,

a wheel assembly secured to one of said sides of the one of said sections to be at the bottom of said tower, and said wheel assembly positioned to permit said sections while nested to be wheeled as a dolly,

a top platform secured across said top of said tower, an extending platform assembly having an extending platform frame and an extending platform attached thereto, said extending platform frame being supported by said tower at a suitable level for said extending platform to function as a footrest while said top platform functions as a seat,

a first cross member secured across said first side of said tower at the level of said extending platform assembly, second and third cross members secured across respective ones of said second and third sides adjacent said first side of said tower at a level somewhat above the level of said first cross member, one end of said extending platform frame being shaped to slide like a drawer over said first cross member into said tower and the difference in level between said first cross member and the level of said second and third cross members being sufficient to permit said one end of said extending platform frame to slide under and in contact with said second and third cross members while said extending platform frame is substantially horizontal and slid inward over said first cross member,

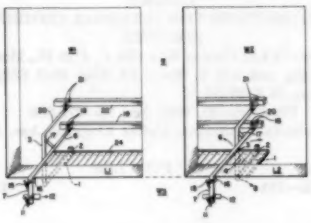
a retaining bar secured over said one end of said extending platform frame and having ends thereof extending closely over said second and said third cross members respectively to prevent any vertical movement of said one of said extending platform assembly while inserted into said tower.

4,428,457

WINDOW BRACKET SUPPORT AND SCAFFOLDING FOR BUILDING EXTERIOR

John T. Fikkers, 805 Rosita Rd., Pacifica, Calif. 94044

Filed Sep. 24, 1982, Ser. No. 423,011
Int. Cl.³ E04G 3/06
U.S. Cl. 182—55 4 Claims



1. A window bracket support for a scaffold supported from a building window sill and the adjacent building wall comprising:

a first vertical member positioned against the exterior of said wall and extending on both sides of said sill;

a second parallel vertical member adjacent the interior of said wall extending beneath said sill;

means for clamping said vertical members to said wall;

a first horizontal member positioned at the lower end of said first vertical member at right angles thereto and welded thereto and projecting beyond the exterior wall of said building;

a second horizontal member positioned upon said sill at right angles to said vertical members and welded thereto;

a third horizontal member positioned at the upper end of said first vertical member and welded thereto;

a first knee brace welded to said first horizontal member and the lower section of said first vertical member;

a second knee brace welded to said second horizontal member and the upper section of said first vertical member;

a short vertical member welded to the outer end of said first horizontal member;

a pair of short parallel vertical members welded to the outer end of said second horizontal member defining a slot therebetween and disposed to hold one end of a first railing therein, perpendicular to said second horizontal member;

a pair of short parallel vertical members welded to the outer end of said third horizontal member defining a slot therebetween and disposed to hold one end of a railing therein perpendicular to said third horizontal member;

said first horizontal member being disposed to hold one end of a horizontal support platform.

4,428,458

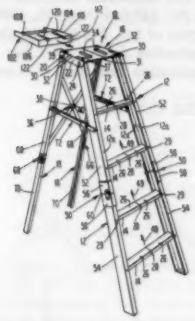
FOLDABLE LADDER

Joseph Fiore, New Rochelle, N.Y., and Louis S. Hoffman, Morristown, N.J., assignors to Turbo Inc., Morristown, N.J.

Filed May 28, 1981, Ser. No. 267,863
Int. Cl.³ E06C 1/28
U.S. Cl. 182—116 10 Claims

1. A foldable ladder of the type having laterally spaced-apart, substantially vertically oriented front side rails joined by a plurality of steps, and substantially vertically oriented rear support means, said side rails and rear support means being movable away from each other into an open position, when said ladder is to be used, and being movable toward each other into a closed position, when said ladder is to be stored, each of said steps being hinged for permitting lateral collapsing of said ladder by movement of said laterally spaced-apart side rails toward each other, said side rails and rear support means including hinge means intermediate vertical ends thereof for

permitting vertical collapsing of the ladder by the folding of the side rails and rear support means about said intermediate hinge means, characterized in that a sectional upper platform is joined to upper ends of the side rails and rear support means and is hinged intermediate its lateral ends for permitting lateral



collapsing of said upper platform by movement of said laterally spaced-apart side rails toward each other, said upper platform including openings on opposite sides of the intermediate hinged connection, said openings being positioned to be in lateral alignment when the upper platform is laterally collapsed to thereby provide a carrying handle.

4,428,459

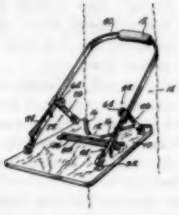
TREE STAND

Paul L. Peck, Fond du Lac, Wis., assignor to Total Shooting Systems, Inc., North Fond du Lac, Wis.

Filed Nov. 8, 1982, Ser. No. 439,763

Int. Cl.³ A47C *9/10*; A45F *3/26*; A01M *31/02*

U.S. Cl. 182—187 **14 Claims**



1. A tree stand having a platform provided with a notch therein adapted to receive a tree trunk,

a flexible metal band adapted to embrace the tree trunk,

support means on each side of the platform for adjustably engaging the band and fixing the band at an angle relative to the platform whereby the band engages the tree in back of and above the platform, said support means being connected to the platform by pivot means allowing the support means to move sideways relative to the platform.

4,428,460

LIFT CAR SUSPENSION

Marco F. Luinstra, Miranda, Australia, assignor to Elevators Pty. Limited, Waterloo, Australia

Filed Oct. 15, 1980, Ser. No. 197,257

Claims priority, application Australia, Oct. 15, 1979, PE0923

Int. Cl.³ B66B *9/00*

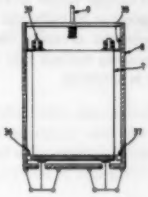
U.S. Cl. 187—1 R **23 Claims**

1. An apparatus for supporting a lift car relative to a lift support member, the apparatus comprising a plurality of suspension units with each unit comprising:

an intermediate member,

first connection means for pivotally connecting the lift car to the intermediate member, comprising a single elongate member fixedly connected at one end portion to said intermediate member and pivotally connectable at the other end portion to the underside of the lift car in the region of the floor of the lift car,

second connection means for pivotally connecting the intermediate member to the lift support member,



wherein, when the unit is installed, the intermediate member is located outside a zone defined between horizontal planes respectively passing through the connection points of the first and second connection means to the lift car and the support member respectively, the relative dimensions of the first and second connection means and the positioning of the points of connection of said connection means to the lift car and the lift car support member being chosen so that the lift car supported with said apparatus has a relatively low natural frequency of oscillation in the horizontal direction compared with the value of 2 Hz.

4,428,461

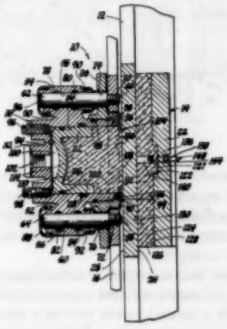
DISC BRAKE CALIPER ASSEMBLY

Edward H. Warwick, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1982, Ser. No. 353,530

Int. Cl.³ F16D *55/224*

U.S. Cl. 188—72.4 **1 Claim**



1. In a disc brake assembly having a rotatable disc to be braked and a slidable caliper assembly actuatable to brake the disc, the improvement comprising:

a caliper housing formed to provide first and second legs positioned on opposed friction braking surface sides of said disc and a bridge section extending peripherally across said disc and joining said legs, said first leg having an internally threaded aperture positioned on an axis parallel to the axis of rotation of said disc;

a hydraulic cylinder having a recess formed therein defining a hydraulic pressure chamber, an externally threaded

open end threaded into said internally threaded aperture to secure said cylinder to said caliper housing, and caliper mounting arms on said cylinder extending outwardly and radially and providing slidable mounting means for slidably mounting and guiding said slidable caliper assembly in directions parallel to the axis of rotation of said disc;

first brake friction material forming brake lining secured directly onto said second leg for braking engagement with one friction braking surface side of said disc;

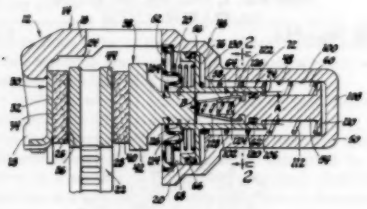
and second brake friction material forming a piston slidably mounted in said caliper recess and reciprocably movable therein and responsive to hydraulic brake actuating pressure in said hydraulic pressure chamber to engage the other friction braking surface side of said disc when the brake assembly is actuated.

4,428,462

LOW DISPLACEMENT DISC BRAKE CALIPER ASSEMBLIES

Edward H. Warwick, Englewood, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1982, Ser. No. 353,561
Int. Cl.³ F16D *55/18*
U.S. Cl. 188—72.4 **4 Claims**



1. A disc brake caliper assembly having a brake shoe assembly adapted to move to engage and disengage a disc to be braked, and a fluid pressure actuator for the brake shoe assembly incorporating reduced displacement and high retraction, said actuator comprising:

a compound piston assembly including a first piston having a first predetermined area exposed to actuating fluid pressure, and a second piston having a second predetermined area exposed to actuating fluid pressure, said second predetermined area being larger than said first predetermined area;

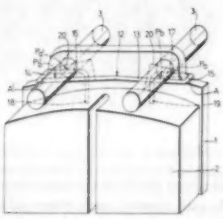
and latching means permitting initial actuating movement of said first piston to move the brake shoe assembly into friction braking engagement with the disc in response to initial actuating fluid pressure acting on said first piston and then latching said first piston to said second piston so that further increase in actuating fluid pressure acts on both of said pistons in a unitary manner to increase the friction braking engagement of the brake shoe assembly with the disc.

4,428,463

RETAINING SPRING FOR THE BRAKE SHOE OF A SPOT TYPE DISC BRAKE

Jochen Burgdorf, Offenbach; Hans-Henning Luepertz, Darmstadt, and Roberto Stoka, Nauheim, all of Fed. Rep. of Germany, assignors to ITT Industries Inc., New York, N.Y.

Continuation of Ser. No. 135,019, Mar. 28, 1980, abandoned, which is a continuation of Ser. No. 970,896, Dec. 19, 1978, abandoned. This application Jul. 31, 1981, Ser. No. 289,014
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802739
Int. Cl.³ F16D *65/00*
U.S. Cl. 188—73.38 **2 Claims**



1. A retaining spring for a brake shoe of a spot-type disc brake comprising:

a backing plate for said brake shoe including an outer central portion and two outer side portions each secured to a different side of said central portion, said central portion and said two side portions being parallel to one surface of a brake disc;

a pair of spaced parallel guide elements disposed parallel to a rotational axis of said brake disc to guide said brake shoe toward and away from said one surface of said brake disc, each of said pair of guide elements slidably engaging a different hole through said central portion inwardly spaced from an uninterrupted planar outer edge of said central portion contained in a first plane perpendicular to said one surface of said brake disc;

a first member parallel to and resiliently engaging throughout its entire length a first surface of said central portion and both of said two end portions parallel to said one surface of said brake disc and resiliently engaging both of said pair of guide elements at said first surface with a predetermined preload;

a second member parallel to and resiliently engaging throughout its entire length a second surface of one of said two side portions and an adjoining portion of said central portion parallel to said first surface and resiliently engaging an associated one of said pair of guide elements at said second surface with said predetermined preload;

a third member parallel to and resiliently engaging throughout its entire length said second surface of the other of said two side portions and an adjoining portion of said central portion and resiliently engaging the other of said pair of guide elements at said second surface with said predetermined preload, their second and third members being spaced from each other and being additionally preloaded toward said first member; and

a pair of fourth planar members each contained in a second plane parallel to and below said first plane extending substantially parallel to said axis, one of said pair of fourth members interconnecting adjacent ends of said first and second members and resiliently engaging an outer edge of said one of said two side portions and the other of said pair of fourth members interconnecting adjacent ends of said first and third members and resiliently engaging an outer edge of said other of said two side portions.

4,428,464

HYDRAULIC DAMPER

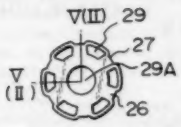
Ieaki Miura, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Sep. 25, 1981, Ser. No. 305,844

Claims priority, application Japan, Sep. 26, 1980, 55-136981[U]

Int. Cl.³ F16F 9/34

U.S. Cl. 188—315 1 Claim



1. In a hydraulic damper including generally vertically disposed coaxial inner and outer tubes, a piston working in said inner tube and partitioning the interior thereof into first and second liquid chambers, a piston rod secured to said piston and extending through said first liquid chamber to the outside of the damper through upper ends of said inner and outer tubes, a rod guide supporting the upper ends of said inner and outer tubes and slidably guiding said piston rod, a base cap supporting the lower ends of said inner and outer tubes, a reservoir chamber defined between said inner and outer tubes and containing therein liquid and gas, and a bottom valve mechanism mounted on said lower end of said inner tube for controlling liquid flow between said second liquid chamber and said reservoir chamber, the improvement wherein said bottom valve mechanism comprises:

a valve seat mounted on said lower end of said inner tube;

a valve body having an orifice passage;

a spring biasing said valve body toward said valve seat; and

a valve guide guiding the movement of said valve body toward and away from said valve seat, said valve guide comprising a generally inverted U-shaped member having a lower end fitted on said valve seat, said U-shaped member including an axially extending imperforate skirt, a plurality of axially extending and circumferentially spaced indentations formed in the outer circumference to said skirt, said indentations forming on the inner circumference of said skirt a plurality of axially extending and circumferentially spaced guide surfaces in guiding contact with the outer circumferential surface of said valve body, said indentations further defining circumferentially therebetween a plurality of axially extending and circumferentially spaced liquid passages between said inner circumference of said skirt and said outer circumferential surface of said valve body, and said U-shaped member further including an upper base portion having therethrough a plurality of openings opening generally into respective said liquid passages.

4,428,465

CONDUCTOR STRIP HOUSING FOR A CONDUCTOR RAIL

Hughes E. Waldmeier, 30, Rue d'Ottmarsheim, 68170 Rixheim, France

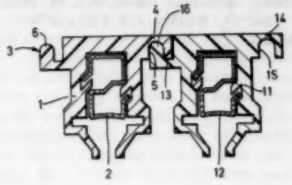
Filed May 15, 1981, Ser. No. 263,858

Claims priority, application Switzerland, May 20, 1980, 3941/80

Int. Cl.³ B60M 1/34

U.S. Cl. 191—23 A 6 Claims

1. An elongate housing member of electrically insulating material defining a downwardly open interior space for reception of a conductor strip so as to form with said strip an electric current conductor rail, said housing member being provided at each of two opposite sides thereof with a respective external connecting rib extending longitudinally of said member, said ribs being so constructed and arranged that said housing member is connectible to a further such housing member in such a manner that said interconnected housing members are disposed at substantially the same height, one of said ribs of said housing



member being provided with means defining a groove in its underside and the other one of said ribs being provided with means defining a head at its upper side, the cross-section of said head corresponding to that of said groove.

4,428,466

CONTROL CURRENT TRANSMITTER IN FORM OF CONTACTOR MEANS WHICH YIELDINGLY ENGAGE A CONTROL CURRENT TRACK FOR A CHASSIS IN TRANSPORT SYSTEMS

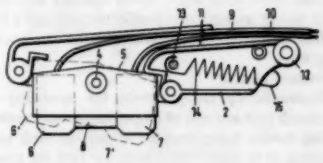
Werner Mayer, Seelbach, Fed. Rep. of Germany, assignor to Translift AG, Kriens-Luzern, Switzerland and Translift Gesellschaft fur Hebe- und Forderanlagen mbH, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,541

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018428

Int. Cl.³ B60L 5/36

U.S. Cl. 191—58 6 Claims



1. In a control current transmitter of the type having contactor means which yieldingly engage a segmented control current track for a trolley in a conveyor system, the improvement comprising

an elongated housing including two half shells joined together and defining an interior chamber therebetween, and

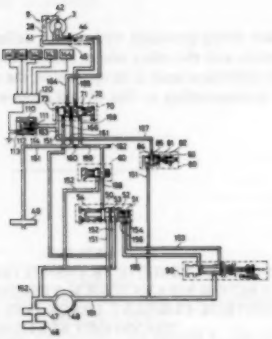
a single rocker pivotably and resiliently mounted in said chamber, and wherein said contactor means includes two contact members having separate control current lines pivotably mounted on said rocker and positioned one behind the other as viewed in the driving direction of the trolley, spaced apart from each other in an insulated manner, and adapted to make contact with said control current track, respectively, said rocker urging said contact members to move outwardly so that said contact members make good contact when operationally engaging said control current track.

4,428,467

FRICTION CLUTCH CONTROL DEVICE

Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,036
Claims priority, application Japan, Mar. 31, 1981, 56-46402
Int. Cl.[3] B60K *41/28*; F16H *3/74*
U.S. Cl. 192—3.31 12 Claims



1. A friction clutch control device located between an engine side drive shaft and a speed changer side input shaft for which power transmission is effected through a fluid coupling of a fluid coupling type automatic speed changer for a vehicle, comprising:

a friction clutch;

a hydraulic operating device for operating said friction clutch into and out of engagement, said hydraulic operating device being coupled in parallel with said fluid coupling so as to provide a separate path for power transmission;

drive condition detecting means for detecting drive conditions of an engine of said vehicle;

speed difference detecting means for detecting a first difference (S) between speeds of said drive shaft and said input shaft;

speed difference setting means for setting a second speed difference (So) between said drive shaft and said input shaft according to a signal provided by said drive condition detecting means;

hydraulic pressure controlling means for controlling a hydraulic pressure supplied to said hydraulic operating device so that said first speed difference (S) detected by said speed difference detecting means approaches said second speed difference (So) set by said speed difference setting means; and

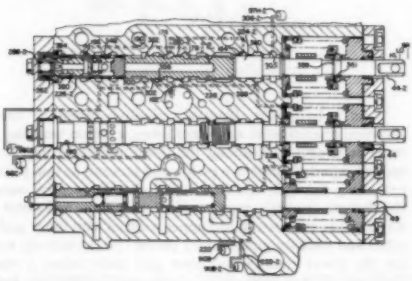
a fail-safe circuit which, when said first speed difference (S) is maintained at an abnormally large level for a predetermined period of time, stops said hydraulic pressure controlling means, to release said friction clutch.

4,428,468

CLUTCH-CLUTCH BRAKE STEERING MECHANISM FOR TRACTORS

Prohir K. Chatterjea, Mount Prospect, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

PCT No. PCT/US81/00844, § 371 Date Jan. 22, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO83/00034, PCT Pub. Date Jan. 6, 1983
Continuation-in-part of Ser. No. 176,815, Aug. 11, 1980, which is a continuation of Ser. No. 951,690, Oct. 16, 1978, abandoned.
This PCT application Jun. 22, 1981, Ser. No. 287,539
Int. Cl.[3] B60K *41/24*
U.S. Cl. 192—13 R 2 Claims



1. In a transmission mechanism,

a drive and braking train having two fluid operated friction engaging steering devices whereof one is a spring-applied brake device (**90B-2**) and the other is a fluid engaged drive device (**96C-2**) disposed so as to be hydraulically paired with the brake device;

a selector valve (**44-2**) for supplying the output from a supply source of operating fluid under pressure having a restricted inlet-outlet port (**200-2**) common to the brake device and to said drive device hydraulically paired therewith and normally operable in a first position (LO) to connect said operating fluid pressure supply source to the common inlet-outlet port, both when the spring applied brake device is unfilled for spring applied braking and when the spring applied brake device is full, exerting full pressure brake release;

plural springs comprising one plurality of springs of one strength operative in the brake device (**90B-2**) for brake application and operatively overcome by the force of the operating fluid pressure for braking pressure neutralization and, thereupon, for filling the brake device and causing the springs to yield for full pressure brake release;

another plurality of the springs of one strength operative in the drive device (**96C-2**) of drive disengagement and operatively overcome by the force of the operating fluid pressure for filling the drive device and causing the springs of the latter to yield for initiating drive engagement;

there being stronger springs in the spring applied brake device (**90B-2**) than in the fluid engaged drive device (**96C-2**) paired therewith so that filling of the latter (**96C-2**) and initiation of its engagement always precedes filling of the brake device through their common inlet-outlet port, thus inherently affording a cushioned drive engagement once initiated, due to the delay time required for fluid to flow through such common inlet-outlet port;

said selector valve (**44-2**) having a second position (HI) independently of the drive device affording filling flow to the spring applied brake device for exerting therein full pressure brake release; and

means (**226-2, 350**) effective when the selector valve is positioned directly from the second position to the first position (HI to LO) to, first, delay while emptying at least

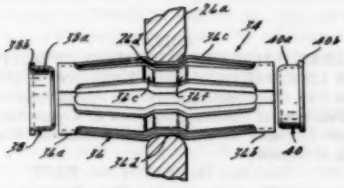
partly through said common port substantial portions of the fill volume of the fluid from the brake device simultaneously into the drive device and to drain and second, following the delay, cooperating with the selector valve to afford fluid flow of the fluid pressure supply into the common inlet-outlet port to supply the devices.

4,428,469

SYNCHRONIZER SPRING PIN

Timothy J. Morscheck, Kalamazoo, Mich.; Robert R. Byar, Medina, Ohio, and Theodore J. Deska, Warren, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1981, Ser. No. 288,724
Int. Cl.³ F16D *11/00, 13/00;* **F16H** *3/38*
U.S. Cl. 192—53 E **10 Claims**



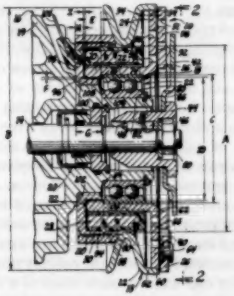
1. A spring comprising:
a unitary sheet metal spring pin having first and second C-shaped end rings and at least two spring leafs extending therebetween, said leafs bowed radially outward from each other in barrel stave fashion and pinched radially inward toward each other at a position between said ends to define a detent groove; and
means to prevent radial flexing of said C-shaped ends.

4,428,470

ELECTROMAGNETIC CLUTCH

George T. Bennett, Kettering, and J. D. Livesay, Tipp City, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 17, 1981, Ser. No. 284,384
Int. Cl.³ F16D *27/00*
U.S. Cl. 192—84 C **3 Claims**



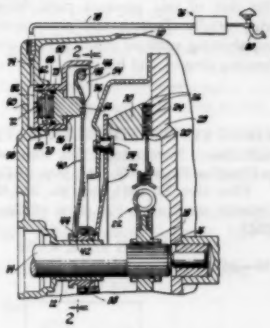
1. In an electromagnetic clutch for use in a confined compartment on a device having a rotatable shaft surrounded by a bearing support, a bearing surrounding and supported by said bearing support in a fixed location, a rotor including a pulley rotatably mounted on said bearing and located thereby and provided with a clutch element of magnetic material, a cooperating clutch element of magnetic material operably connected to said shaft, electromagnetic means including a coil associated with the clutch element on said rotor for attracting the clutch element on said shaft and a coil housing cooperating with said rotor for containing said coil and forming a magnetic flux path, the improvement in said rotor, coil and coil housing for compacting the electromagnetic clutch and precisely controlling and maximizing air gap areas thereof, said rotor and said coil housing comprising opposed annular members surrounding said bearing support and defined by radially inner and outer walls which telescope in air gap defining relationship with each other and additionally form an axially elongated cavity therebetween extending between the inner diameter of said pulley and the inner wall of said rotor, said coil defined as a cylinder contiguous with the radially outer wall of said coil housing but spaced from the radially inner wall thereof and axially longer than both the inner and outer wall of said coil housing to project therefrom into said cavity unsupported at said pulley so that the inner diameter of said pulley can be reduced to compact the clutch by approaching the outer diameter of said coil, the inner wall of said rotor being axially longer than said bearing to project from its mounting on said bearing at substantially the outer diameter thereof into the space formed between said coil and the inner wall of said coil housing to precisely control the air gaps between both said inner and outer walls where they telescope with each other and to form a radial air gap of maximum area with the inner wall of said coil housing by reason of the diameter of said inner rotor wall being substantially the same as the outer diameter of said bearing.

4,428,471

CLUTCH OPERATOR WITH A HYDRAULIC ACTUATOR

Donald L. Parker, Middletown, and Edward H. Warwick, Englewood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1982, Ser. No. 362,403
Int. Cl.³ F16D *25/08, 13/44*
U.S. Cl. 192—85 C **1 Claim**



1. A clutch operating structure for a selectively operable friction clutch which is rotatably mounted wholly within a clutch housing, said structure comprising; a cavity formed in the clutch housing; a cylinder and pivot support housing supported in said cavity and including a hydraulic cylinder portion and a lever support portion; means securing said cylinder and pivot support housing to said clutch housing and being positioned for providing a pivot surface; a clutch operating lever having one end pivotally disposed on said pivot surface and the other end operatively connected with said friction clutch; piston means slidably disposed in said cylinder portion; spring means disposed in said cylinder portion for maintaining said piston means in abutting relation with said clutch operating lever intermediate the ends thereof; and fluid passage means in communication with said cylinder portion for conducting pressurized fluid thereto for actuating said piston

means to cause pivoting of said clutch operating lever for selectively operating said friction clutch.

4,428,472

SLIDING SLEEVE FOR CLUTCH THROW-OUT

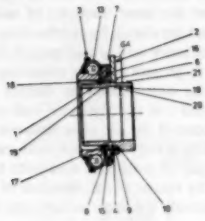
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,452

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 8004785[U]

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **6 Claims**



1. In a sliding sleeve for a clutch release including a hub element with a cylindrical surface, a pressure plate connected to said hub element, said pressure plate having abutting surfaces for a self-centering clutch thrust-bearing and for an actuating lever of the clutch; the improvement wherein said hub element has a plurality of radially extending protrusions spaced about its circumference, said pressure plate surrounding the cylindrical surface of said hub element, the side of said pressure plate facing said actuating lever abutting a shoulder of said hub element, the side of said pressure plate facing said clutch thrust-bearing axially abutting said protrusions, said protrusions having abutting surfaces positioned to circumferentially engage a bearing ring of said bearing.

4,428,473

FEEDING SYSTEM FOR BULK MATERIALS

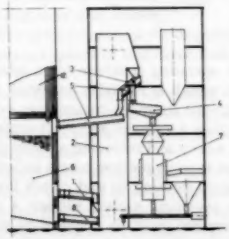
Ulrich Schalkhäuser, Norderstedt, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,454

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040343

Int. Cl.³ B65G *47/18, 47/51*

U.S. Cl. 198—367 **1 Claim**



1. A discharge system for removing particulate material from a bulk particulate material containing silo comprising:

a bulk material conveyer means receiving said bulk particulate material from the bottom of said silo;

a bucket conveyer means adjacent said silo receiving said bulk particulate material from said bulk material conveyer;

a packing means;

a relief chamber in said silo adapted and constructed to contain a portion of said particulate material serving to separate the bulk material conveyer from the silo and being in communication with said main storage chamber of the bulk material coveyor and with the silo interior; and

a switch means receiving said bulk material from said bucket conveyer means and normally delivering said bulk material to said packing means but being automatically operable when said packing means has a pre-determined quantity of said particulate material to divert said particulate material to said relief chamber from where said particulate material is again discharged to said bulk material conveyer.

4,428,474

APPARATUS FOR THE ALIGNMENT OF BOTTLES OR THE LIKE, PARTICULARLY LABELING MACHINES

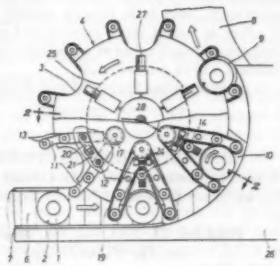
George Gau, Obertraubling, and Erwin Pesold, Regenstauf, both of Fed. Rep. of Germany, assignors to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik, Worth, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,797

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022343

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—394 **1 Claim**



1. Apparatus for rotating bottles so that randomly oriented reference markers on the respective bottles assume preferred and similar angular orientations, said apparatus comprising:

a radially extending unit for being driven rotationally about an axis, said unit having a plurality of circumferentially spaced apart bottle receivers presenting recesses, respectively, in a direction radially away from said axis,

a plurality of pairs of cooperating movable elements comprising a pair of levers mounted for pivoting on said unit towards and away from each other on opposite sides of each receiver, the pivot axes thereof being located between the rotational axis of said unit and a bottle receiver associated therewith, said levers in a pair diverging in the radial direction to dispose the radially remote end portions thereof on one and the other sides of a receiver,

roll means on each of said levers and a closed loop belt running on said roll means, said roll means being arranged such that a portion of said belt will be on one side of a bottle that has entered the receiver and another portion of the belt will be on the other side for gripping a bottle, said roll means including a pair of radially spaced apart rolls on each lever and one of said radially spaced apart rolls being radially inward from the circle defined by the middle axis of said bottles and the other being radially outward therefrom such that said portions of the belt which grip a bottle

extend between said radially spaced rolls for curing complementarily with the periphery of a bottle,

slidable members on said unit, springs for pressing said members, respectively, radially inwardly and an idler roll on each member pressing against a belt under the influence of said springs at a place intermediate said belt portions that engage the two sides of a bottle,

spring means for urging said diverging levers on each pair toward each other,

means coupling said levers in a pair to move jointly with each other, a guide roller coupled to said means for coupling the levers, a stationary cam engaged by said guide roller such that when said guide roller is on one portion of said cam said levers are held at maximum divergence in opposition to said spring means for receiving a bottle that enters a receiver means when said rotatable unit is in one angular position and when said guide roller advances rotationally to another portion of said cam said levers swing toward each other under the influence of said spring means to cause said belt portions to grip and carry the bottle to a predetermined angular position

a plurality of motor means supported from said radially extending rotatable unit and means for coupling said motor means, respectively, in driving relation with a belt, said motor means when energized causing said belt to translate and to rotate the gripped bottle, while said unit is rotating to said predetermined angular position at which said grip is released by said guide roller again engaging said one portion of the cam,

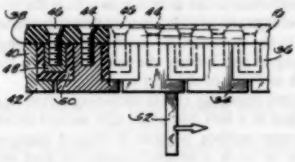
a scanning device for markers, said device effecting energization of said motor means and rotation of a gripped bottle until its marker has assumed said preferred orientation and then effecting deenergization to lock the bottle against rotation up to the time the bottle is released.

4,428,475

HEAVY MATERIAL CONVEYOR BELT WEAR PROTECTION

William T. Barrett, Waukesha, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 2, 1981, Ser. No. 326,566
Int. Cl.³ B65G *15/58*
U.S. Cl. 198—699 **7 Claims**



1. A wear protected belt comprising, in combination,

an elongated, generally flexible belt, having a face and a longitudinal axis,

a plurality of plates attached to and substantially covering a longitudinal portion of said belt, with each of said plates extending across the face of said belt at an angle to the longitudinal axis of said belt, said plates comprising:

a first plate portion which projects laterally from the face of said belt,

a second plate portion attached to and projecting from said first plate portion generally parallel to but spaced from and over-lapping a portion of said belt, and

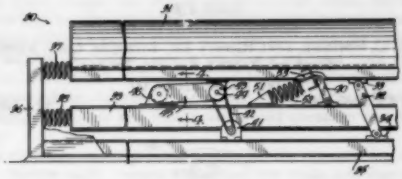
a resilient shock absorbing bar means disposed between said second plate portion and said belt so that articles impacting on said second plate portion cause said second portion to engage said bar means and said bar means absorbs said impact.

4,428,476

VIBRATORY APPARATUS

Richard B. Kraus, and Albert Musschoot, both of Barrington, Ill., assignors to General Kinematics Corporation, Barrington, Ill.

Continuation of Ser. No. 175,883, Aug. 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 53,855, Jul. 2, 1979, abandoned. This application Jul. 26, 1982, Ser. No. 401,736
Int. Cl.³ B65G *27/08*
U.S. Cl. 198—764 **9 Claims**



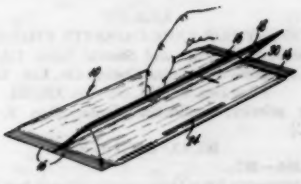
1. A vibratory conveyor comprising an elongated material-carrying member, a base, a plurality of legs for pivotally supporting the material-carrying member on the base for generally horizontal reciprocating movement, first spring means for isolating the material-carrying member from the base, an exciter member, second spring means for isolating the exciter member from the base, said exciter member being elongated in the direction of the elongation of the material-carrying member, a plurality of arms suspending the exciter member from the material-carrying member for generally horizontal reciprocating movement, said first isolation spring means being positioned to be compressed by the material-carrying member alternately at the end of each reciprocal movement of said material-carrying member and said second isolation spring means being positioned to be compressed by the exciter member alternately at the end of each reciprocal movement of said exciter member, a plurality of force transmitting springs extending upwardly from the exciter member to the material-carrying member along an axis substantially perpendicular to the legs, vibration generating means mounted on the material-carrying member for imparting vibratory movement to said material-carrying member and to said exciter member, and means for driving said vibration generating means.

4,428,477

RESEALABLE PACKAGE FOR PREMOISTENED TOWELLETTES

Angelo R. Cristofolo, North Brunswick, N.J., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jan. 8, 1982, Ser. No. 338,462
Int. Cl.³ B65D *33/16*
U.S. Cl. 206—210 **4 Claims**



1. A resealable package for premoistened towellettes comprising a sheet of flexible moisture-impermeable material, said sheet being folded about the towellettes forming an inverted T-shaped package with the towellettes contained within the base of the inverted T-shaped package and having two end flaps forming the stem of the "T", said folded sheet being

permanently sealed along its side edges and permanently sealed along the edges of the end flaps, said end flaps being folded flat onto the base of the "T" in the non-dispensing position and one of the end flaps of the sheet material in the stem of the "T" being provided with a region of weakening, spaced from the juncture of the base and stem of the "T", such that the stem may be unfolded to reform the package into the form of an inverted "T" in the dispensing position and an opening may be made in the package at the region of weakening, and the towellettes dispensed therethrough.

4,428,478

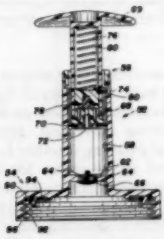
SELF-LIMITING PUMP

Allan C. Hoffman, 2891 Rumsey Dr., Riverside, Calif. 92506

Filed Jul. 7, 1982, Ser. No. 396,011

Int. Cl.³ B65D *83/00*

U.S. Cl. 206—315.9 **11 Claims**



5. A pressurization cap for a game ball container comprising:

(a) an externally threaded collar adapted for positioning around the container to bear against the bottom of the top ring thereof;

(b) an internally threaded cap adapted to be threaded onto said collar, said cap having a sealing gasket disposed about the inner periphery thereof;

(c) a cylinder carried by said cap having a one-way outlet valve communicating through said cap;

(d) a piston disposed within said cylinder for recriprocating, pumping, motion, said piston having a hollow portion in communication with the pump's cylinder, said hollow portion having a vent opening;

(e) a piston member disposed within said hollow portion, said piston member being moveable by the pressure being developed by the piston during its compression stroke between a first position blocking said vent opening and a second position exposing said vent opening; and

(f) bias means for biasing said piston member towards said first position and for preventing said second position from being reached until a desired pressure is attained in said cylinder whereby the pressure output of said pump is limited to said desired pressure.

4,428,479

ACCESSORY FOR TAPE-CASSETTE STORAGE BOX

Hideo Shirako, Hachioji, and Shoichi Saito, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,704

Claims priority, application Japan, Dec. 9, 1980, 55-176298[U]

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **16 Claims**

1. An accessory for a tape-cassette storage box including a box body for storing a micro-cassette, a cover member attached to the box body and freely swingable between a first position in which the cover member cooperates with the box body to house the micro-cassette in the box body and a second position in which the cover member allows the micro-cassette to be housed in and taken out of the box body, a first outer surface formed on the box body and parallel to the first outer surface, a first engaging means arranged on the first outer surface, and a second engaging means arranged on the second outer surface, said accessory comprising:

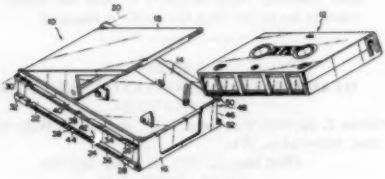
an accessory body having a space in which articles are held;

an outer surface portion on which at least one of said first and second engaging means is arranged; and

a movable member attached to the accessory body and freely swingable between a first position in which the movable member cooperates with the accessory body to house said articles in the accessory body and a second position in which the movable member allows said articles to be housed in and taken out of the accessory body;

said outer surface position being of rectangular shape and said first and second outer surfaces being also of rectangular shape respectively;

said first engaging means including a first engaging claw arranged at a first corner on said first outer surface or said outer surface portion, a second engaging claw arranged at a second corner on said first outer surface or said outer surface portion which is spaced from the first engaging claw in a direction substantially perpendicular to the direction in which the first engaging claw is engaged and having the same engaging direction and length as those of the first engaging claw, a third engaging claw arranged at a third corner on said first outer surface or said outer surface portion which is spaced from the first engaging claw in the direction in which the first engaging claw is engaged and having the same engaging direction and length as those of the first engaging claw, and a fourth engaging claw arranged at a fourth corner on said first



outer surface or said outer surface portion which is spaced from the third engaging claw in a direction substantially perpendicular to the direction in which the third engaging claw is engaged and also spaced from the second engaging claw in the direction in which the second engaging claw is engaged and having the same engaging direction and length as those of the first engaging claw;

said second engaging means including a first engaged claw arranged at a first corner on said second outer surface or said outer surface portion, a second engaged claw arranged at such a second corner on said second outer surface which is spaced from the first engaged claw in a direction substantially perpendicular to the direction in which the first engaged claw is engaged and having the same engaging direction and length as those of first engaged claw, a third engaged claw arranged at a third corner on said second outer surface or said outer surface portion which is spaced from the first engaged claw in the direction in which the first engaged claw is engaged and having the same engaging direction and length as those of the first engaged claw, and a fourth engaged claw arranged at a fourth corner on said second outer surface which is spaced from the third engaged claw in a direction substantially perpendicular to the direction in which the third engaged claw is engaged and also spaced from the second engaged claw in the direction in which the second engaged claw is engaged and having the same engaging direction and length as those of the first engaged claw; and

when the first engaging means on said tape-cassette storage

box or accessory is engaged with the second engaging means on said accessory or said tape-cassette storage box, the first-to-fourth engaging claws of said first engaging means are engaged with the first-to-fourth engaged claws of said second engaging means.

4,428,480

CONTAINER FOR TAPE CASSETTES

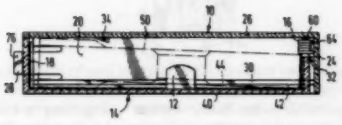
Peter Ackeret, Schubelwis 4, CH-8700 Kusnacht, Switzerland

Filed Apr. 9, 1982, Ser. No. 367,074

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114298; Apr. 9, 1981, 3114333

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **20 Claims**



1. A container for use in the storage of a magnetic tape cassette comprising:

a housing;

an open topped drawer, said drawer being slidably received in said housing and cooperating therewith to define a tape cassette receiving recess;

ejection spring means positioned within said housing and cooperating with a wall of said housing and said drawer to bias said drawer in the open direction, said spring means comprising a coiled torsion spring having a leg projecting from at least one end thereof, said torsion spring being positioned such that when a cassette is accommodated in the container with the tape-head opposing face of the cassette adjacent a front wall of said drawer the spring lies on the side of the cassette which faces away from the bottom of said drawer whereby the spring is disposed in the space left in the container on either side of the portion of increased thickness adjacent the tape-head opposing face of a standard magnetic tape cassette, and

releasable latch means, said latch means being manually operated, said latch means retaining said drawer in the inserted position in said housing against the bias of said ejection spring means when said latch means is in the engaged condition.

4,428,481

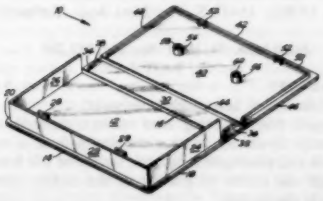
UNIVERSAL STORAGE CONTAINER FOR VIDEO CASSETTES

Robert A. Basili, Waldwick, N.J., assignor to Plastic Reel Corporation of America, Elmwood Park, N.J.

Filed Feb. 1, 1983, Ser. No. 462,981

Int. Cl.³ B65D *85/67*

U.S. Cl. 206—387 **13 Claims**



1. A universal storage container for securely retaining either a first or second size video cassette, each of which includes an outer cover and a pair of reels mounted therein, the reels of the first size video cassette being spaced further apart than the reels of the second size video cassette, each said reel including a central mounting hole and said outer cover including a pair of apertures providing access to the mounting holes in said reels, the access apertures being larger than their respective mounting holes, said reels in each cassette being movable a limited distance toward and away from each other but being biased to return to a central alignment with respect to the respective access apertures, such that when the reels of the first size video cassette are moved closest to each other, the distance between the innermost extremities of the mounting holes therein defines a first distance, and such that when the reels of the second size video cassette are moved farthest from each other, the distance between the outermost extremities of the mounting holes defines a second distance, said second distance being greater than said first distance, said container comprising:

a generally rectangular enclosure having opposed top and bottom walls, opposed front and rear walls, and opposed side walls, said top and bottom walls being hingedly connected to said rear wall; and

a pair of mounting posts disposed on and projecting from said bottom wall for engagement with the central mounting holes of the reels in said first and second size cassettes, said mounting posts being dimensioned and spaced from one another such that the distance between the innermost extremities of said mounting posts is not less than said first distance, and such that the distance between the outermost extremities of said mounting posts is not greater than said second distance, whereby when said reels of said first size cassette are biased toward each other, said first size cassette may be placed in said container with the mounting posts thereof extending into the respective mounting holes with the biasing force of said reels of said first size cassette away from each other retaining said first size cassette in said container, and whereby when said reels of said second size cassette are moved away from each other said second size cassette may be placed in said container with the mounting posts thereof extending into the respective mounting holes in said second size cassette with the biasing force of said reels of said second size cassette toward each other retaining said second size cassette in said container.

4,428,482

STORAGE CASE FOR A CASSETTE

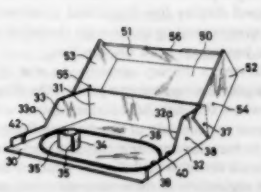
Kimio Ogawa, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 20, 1982, Ser. No. 409,896

Claims priority, application Japan, Aug. 21, 1981, 56-122946[U]; Aug. 21, 1981, 56-122947[U]; Aug. 21, 1981, 56-122948[U]; Aug. 21, 1981, 56-122949[U]; Aug. 21, 1981, 56-130140

Int. Cl.³ B65D *85/672*

U.S. Cl. 206—387 **17 Claims**



1. A storage case for a cassette having a container including a front lid and a pair of juxtaposed supply and takeup reels housed in the container and having teeth defined on a flange of

the takeup reel and partly exposed through a recess in the container, the supply reel having a hole for receiving a supply reel disc of a recorder-reproducer, said storage case comprising:

a base including a bottom having front and rear edges, a rear wall extending from said rear edge of the bottom, and a pair of spaced side walls extending from said rear wall toward said front edge of the bottom, said base having at least one stopper for engaging the teeth on the takeup reel flange to prevent the takeup reel from rotating when the cassette is placed in the storage case;

a sole projection mounted on said bottom for being inserted into the hole in the cassette supply reel to position the supply reel when the latter is placed in the storage case with the front lid facing said rear wall; and

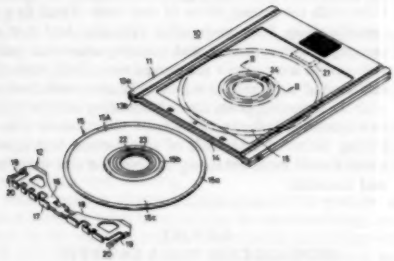
a cover including a top having front and rear edges, a front wall extending from said front edge of the top, and a pair of spaced wide walls extending from said front wall toward said rear edge of the top, said side walls of said cover being pivotably mounted on said side walls of said base to allow said cover to be angularly movable between open and closed positions with respect to said base.

4,428,483

DISC ACCOMMODATING CASE

Osamu Narita, and Takushi Hayashi, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 23, 1981, Ser. No. 276,667
Claims priority, application Japan, Jun. 27, 1980, 55-90304[U]
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—459 **3 Claims**



1. A disc accommodating case comprising:

an opaque jacket having an opening portion at one end thereof, for accommodating a disc having information signals, said disc being received within an internal space formed between a pair of jacket halves of said jacket; and

a lid member for closing the opening portion of the jacket accommodating said disc,

said disc having a portion on one surface side thereof where a ring shaped display line is marked concentrically with the disc, a corresponding portion on the other surface side of the disc having no such display line,

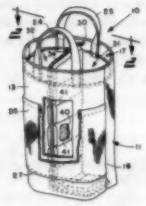
said jacket having a display window on one of the jacket halves at a position opposing a part of the display line on said disc when the disc is accommodated with the case with said one surface side of the disc opposing said one of the jacket halves, for enabling only the part of said display line to be seen through said display window from outside said jacket regardless of the rotational position of the disc with respect to the jacket, whereby the surface side of the disc opposing the window is identified dependent on whether the part of the display line is visible through said window.

4,428,484

PORTABLE WINE BOTTLE CARRIER

Rosemary C. Rattay, and M. Joan Rattay, both of 4942 N. Sedgewick, Lyndhurst, Ohio 44124

Filed Jan. 19, 1982, Ser. No. 340,836
Int. Cl.³ B65D *5/48, 25/06*
U.S. Cl. 206—548 **22 Claims**



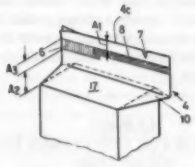
1. A portable wine bottle carrier comprising a tote bag having a non-rigid bottom and sides and an open top, and divider means dividing the interior of the bag into a pair of vertical compartments suitable for receipt of wine bottles, respectively, said divider means including a flexible padded tongue held at its lower end to the bottom of said bag, whereby bottles carried in the bag in said compartments are maintained in spaced, cushioned relationship.

4,428,485

TEAR-OPEN CLOSURE FOR A DOUBLE BAG

Alwin Egli, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Continuation-in-part of Ser. No. 44,207, May 30, 1979. This application Aug. 18, 1981, Ser. No. 294,002
Claims priority, application Switzerland, Mar. 16, 1979, 2520/79
Int. Cl.³ B43M *7/00*; B65D *3/26*
U.S. Cl. 206—604 **8 Claims**



1. A dual bag comprising in combination:

(a) an inner liner and an outer wrap;

4,428,486

SELF-BALANCING BELT CADDY

Wesley A. Collins, 18417 S. Van Ness Ave., Torrance, Calif. 90504

Filed Mar. 24, 1982, Ser. No. 361,291
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—119 **5 Claims**

1. A self-balancing belt caddy comprising:

a V-shaped frame having two traveler arms extending obliquely, upwardly and symmetrically from a medially vertical axis passing through the vertex of the frame and through the center of gravity of the caddy when said caddy is suspended;

means extending upwardly from said vertex and along said axis to suspend said frame from a fixed support;

a plurality of hooks having eyelets slidingly engaged on said

traveler arms, said hooks being free to gravitate toward said vertex to balance said caddy when supporting a load; and

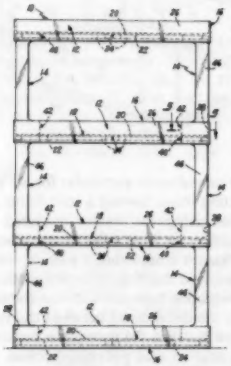
wherein each of said traveler arms includes two parallel bars having their tips spanned by end segments so that said bars and segments define a continuous loop and said hooks are captured on said loop in sliding relation along said traveler arms.

4,428,487

DUAL SIDE WALL LOCKING ATTACHMENT FOR TRAYS TO VERTICAL LEGS IN SECTIONAL DISPLAY RACK

James Hepp, 27-50 First St., Long Island City, N.Y. 11102

Filed Apr. 15, 1982, Ser. No. 368,704
Int. Cl.³ A47F 3/14
U.S. Cl. 211—126 **6 Claims**



1. A sectional display rack comprising:

a plurality of horizontal regular polygonal trays, each tray formed of plastic material with a planar bottom supporting surface which is located intermediate the flanged side walls of the regular polygon;

a support leg of dihedral cross section fitted into each corner of each tray, each support leg formed of plastic having a body portion and a winged portion which extends from the corner of said body portion at the top and bottom, said wing portion being covered by the flange of the tray so that the height of the lower wing portion of the supporting leg is approximately equal to the flange projecting above the bottom wall of the tray and height of the upper wing portion is approximately equal to the height of the flange projecting downwardly below the bottom wall of the tray;

dual rib projections having a curved edge extending substantially perpendicular to the bottom floor of the tray, one dual set above and one dual set below the bottom floor of the tray at a location away from the dihedral corner of the tray to provide a space as thick as the wing portion of the support leg whereby the edge of the lower wing portion extending dihedrally from the corner comes into engagement with the inner wall of the tray upon which the legs are supported and the upper wing portions fit next to the wall of the flange at the top of the leg and below the bottom support of the tray at the top of said leg;

a reversed beveled edge at the bottom of each wing portion to adapt the fitting of each wing portion to the curved edge of said rib; and

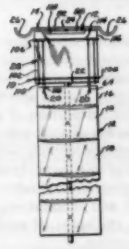
locking means included in said trays and support legs comprising wedge shape cams and recesses to lock the wings next to the inner wall of each tray when the trays and support legs are assembled.

4,428,488

DEVICE FOR SUPPORTING SPONGE COLLECTION BAGS

James D. McAvinn, Palatine, and Felipe S. Li, Lake Zurich, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Aug. 24, 1981, Ser. No. 295,337
Int. Cl.³ A47F 5/01
U.S. Cl. 211—181 **2 Claims**



1. A device for supporting sponge collection bags from a pole, comprising:

a basket having opposed front and back sides, a pair of opposed ends connecting said sides, a bottom, an open top, with said sides, ends and bottom defining a cavity to receive a box of sponge collection bags through the open top, said basket having a pair of spaced hooks depending from said front side and being directed away from the front side, and a pair of spaced hooks depending from said back side and being directed away from the back side, with said hooks being adapted to be received in spaced apertures of the sponge collection bags, said hooks having an inner portion connected to the basket and an outer end portion being spaced from said inner portion;

means for supporting the basket on the pole and

a sponge collection bag received on said front hooks.

4,428,489

ROTARY RAILROAD CAR F COUPLER

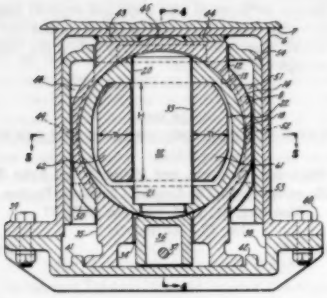
Richard M. Hanula, Lyndhurst, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 17, 1981, Ser. No. 322,217
Int. Cl.³ B61G 9/00
U.S. Cl. 213—62 A **10 Claims**

1. A rotary railroad coupler assembly mounted within an AAR standard carsill housing secured to the underside of a railroad car and wherein said housing has predetermined height and width dimensional limitations, said assembly comprising:

(a) a yoke received in said carsill housing in spaced relation from the underside thereof and including a front end

having a generally cylindrical opening extending therethrough, said yoke having a pair of opposed top and bottom straps extending from said yoke front end with a top ridged portion extending outwardly of said top strap longitudinally thereof from adjacent said yoke front end, said top ridged portion allowing said opening to be increased in diameter while maintaining predetermined minimum wall thickness dimensions in the area of said yoke surrounding said opening, the increase in diameter of said opening thereby allowing said coupler assembly to accommodate a larger, sturdier car coupler shank; and,



(b) a pair of twin parallel wearplates disposed longitudinally of said yoke top strap between said yoke and the underside of said carsill housing disposed closest to the railroad car, said wearplates being spaced apart a sufficient distance to receive the top ridged portion of said yoke therebetween while engaging areas of said yoke adjacent thereto, said wearplates engaging said yoke within the predetermined height dimension of said carsill housing while allowing the diameter of the generally cylindrical opening in said yoke to be maximized and maintaining at least the predetermined minimum thickness of said yoke at the area surrounding said opening.

4,428,490

DRINKING VESSEL WITH INTEGRAL STRAW

Richard D. Holloway, 2 Chepstow Villas, London, W.11, England

Filed Sep. 29, 1982, Ser. No. 426,865

Claims priority, application United Kingdom, Oct. 15, 1981, 8131111

Int. Cl.³ A47G *19/22*

U.S. Cl. 215—1 A **27 Claims**

1. A one-piece drinking vessel adapted for use as a martini glass at cocktail parties and comprising:

a reservoir for holding liquid, said reservoir having a base region and an upper rim region; and

a continuous integral tube one open end of which is permanently and integrally secured in liquid flow communication with the base region of said reservoir while its other open end is disposed above and spaced from said rim region, whereby through said other open end liquid in the reservoir can be sucked in the manner of a drinking straw;

a portion of the tube being shaped to extend downwardly from said base region so as to provide a stable support base of the vessel; and

the reservoir being substantially and distinctly larger in capacity than the total capacity of the tube, whereby:

the reservoir portion closely simulates a conventional drinking glass of the martini-glass type, and

the downwardly extending portion of the tube simulates the delicate stem and base of such a conventional drinking glass of the martini-glass type; but

the above-disposed open end of the tube simulates a conventional drinking straw.

4,428,491

FREIGHT CONTAINER, IN PARTICULAR FOR AIR TRANSPORT

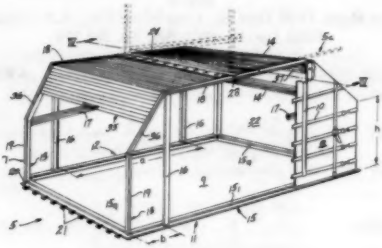
Gerhard Mittelmann, Oehningen, and Klaus P. Brodbeck, Singen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 11, 1981, Ser. No. 272,718

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024410

Int. Cl.³ B65D *88/14*

U.S. Cl. 220—1.5 **14 Claims**



1. In a freight container in particular for air transport comprising a supporting frame having a base frame, a pair of substantially parallel polygonal frames mounted on said base frame so as to define the long sides of the container, each of said polygonal frames comprising a pair of vertical opposed corner posts connected together by a roof section and a pair of vertical struts positioned between said base frame and said roof section such that the distance (a) between the vertical struts is equal to twice the distance (b) between a corner post and the closest vertical strut of said polygonal frame, a flat section connecting the respective roof sections of said pair of polygonal frames approximately midway between said corner posts and clamping means fixed to said flat section wherein the vertical struts of containers identical to said freight container when stacked are aligned and the clamping means on the flat sections of the lower of the identical containers secures the upper of the identical containers in place.

4,428,492

GANGABLE HOUSING

Robert W. Jorgensen, Niles, Mich., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Mar. 8, 1982, Ser. No. 355,769

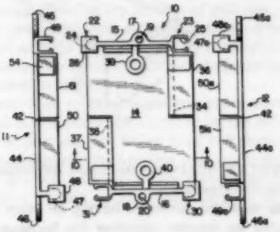
Int. Cl.³ H02G *3/10*

U.S. Cl. 220—3.94 **16 Claims**

1. A housing structure, comprising

a first central body comprising a generally L-shaped member having a back wall extending perpendicularly between

parallel end wall portions, each of said end wall portions having male coupling means along one side edge thereof and female coupling means along the other side edge thereof, said female coupling means on said end wall portions opening in opposite directions from each other, said back wall including a generally planar member having side edges extending between said end wall portions, said male and female coupling means on said end wall portions extending laterally to an extent equal to or less than said planar member side edges; and



first and second identical generally planar side wall units, each of said side wall units having a substantially rectangular wall portion and having male coupling means along one edge thereof and female coupling means along an opposite edge thereof, each of said coupling means on each of said side wall units facing perpendicular to the plane of the side wall portions and in the same direction; the distance between said end wall portions being selected such that either of said side wall units can be coupled to either side of said first central body to form a housing.

4,428,493

MULTIPLE SECTION WASTEBASKET AND THE LIKE

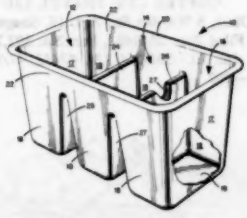
Suellen McDonough, 16 Meserve St., Durham, N.H. 03824

Continuation of Ser. No. 666,892, Mar. 15, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,031

The portion of the term of this patent subsequent to Mar. 16, 1990, has been disclaimed.

Int. Cl.³ B65D *21/02, 1/24*

U.S. Cl. 220—20 **1 Claim**



1. A multiple-compartment closely stackable wastebasket for separating trash in bags having, in combination, a generally rectangular container consisting of a single piece of molded plastic, said container having trapezoidal end walls and longer trapezoidal side walls, said container being interiorly transversely compartmented by open-ended inverted V-shaped separator walls into three substantially similar substantially trapezoidal-walled compartments of rectangular horizontal cross-section for receiving conventional shopping bags, the separator walls extending transversely between the side walls of the container along the length of the compartments and extending upwardly from the lowermost extremity of the container substantially three-quarters of the height of the container such that the end compartments are provided with transverse end walls of greater height than the intermediate compartment transverse end walls formed by said separator walls, the end walls of each compartment diverging upwardly with substantially the same angle of divergence as the end walls of the other compartments, and the side walls of each compartment diverging upwardly with substantially the same angle of divergence as the side walls of the other compartments, the angle subtended by the V-shaped separator walls being of the order of 20–25 degrees, the compartments having bottom walls constituting the lowermost extremity of the container, the upper edge of the separator walls and the edges between the compartment bottom walls and the compartment side and end walls being arcuately curved, and the container being open at the top and having an upper rectangular edge peripherally bounded by a lip, the wall thickness of the container being of the order of one-eighth inch.

4,428,494

EASILY-OPENABLE HEAT SEAL LID

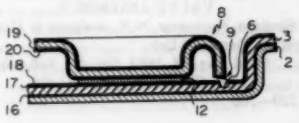
Kazumi Hirota, Tokyo; Yotaro Tsutsumi, Yokohama; Senji Itoh, Ayase; Tadahiko Katsura, Yokohama; Kikuo Matsuoka, Yokohama; Ichiro Hori, Yokohama, and Toshihiko Hayashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,726

Claims priority, application Japan, Oct. 19, 1981, 56-165833

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **5 Claims**



1. An easily-openable heat seal lid for sealing a vessel proper by forming a heat-sealed portion between the lid and the vessel proper, which comprises a laminate comprising at least an inner face member composed of a thermoplastic resin and a metal foil, wherein scores defining a portion to be opened are formed on the side inner than the portion to be heat-sealed so that the scores extend to the midway of the thickness direction of the metal foil, an opening tab is formed on the portion of the lid to be opened through a bonding fulcrum portion composed of a thermoplastic resin hot adhesive so that the push-tearing top end of the opening tab is located on the scores, and the peel strength between the opening tab and the lid in said bonding portion is at least 0.4 Kg/5 mm.

4,428,495

SELF-LOCKING DEVICE

Robert A. Williams, 2721 White Settlement, Fort Worth, Tex. 76107

Filed Jan. 21, 1983, Ser. No. 459,800

Int. Cl.³ B65D *41/04*

U.S. Cl. 220—288 **14 Claims**

1. A self-locking device, comprising:

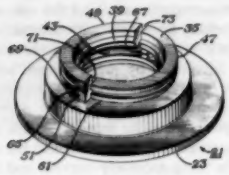
an end means,

an annular wall means extending from one side of said end means,

interior threads formed around the inside of said annular wall means whereby said device may be screwed to the exterior threads of a member,

at least one slot formed through said annular wall means defining a wall portion of said annular wall means with said slot located between said wall portion and said end means,

a portion of said interior threads being formed on the inside of said wall portion,



said wall portion being deformed into said slot a small amount such that said wall portion extends into said slot a small amount, and

a gap formed through said wall portion.

4,428,496

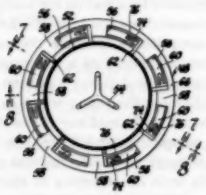
VALVE ASSEMBLY

Sante P. Sardano, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1982, Ser. No. 410,400

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—300 **2 Claims**



1. A valve assembly having a cover releasably locked to a hollow body, said body having a cylindrical outside wall and an annular end wall defining an opening into said body, said outside wall having a plurality of peripherally spaced lugs projecting radially therefrom, said cover including a lid engaging said body for closing said opening, a plurality of webs projecting radially from said lid, each of said webs extending axially along said body adjacent one of said lugs to prevent rotation of said cover in one direction upon said body, each of said webs having a foot extending peripherally about said body and engaging behind one of said lugs to prevent withdrawal of said cover axially from said body, and a finger cantilevered from each of said webs, each of said fingers extending peripherally about said body and engaging one of said lugs to prevent counter rotation of said cover in the other direction upon said body, whereby said cover may be removed from said body only by simultaneously lifting each of said fingers to permit counter rotation of said cover upon said body with said fingers sliding over said lugs and said feet sliding out from behind said lugs followed by withdrawal of said cover axially from said body.

4,428,497

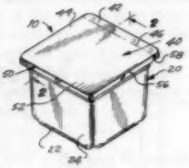
DISPENSER FOR MOIST TOWELETTES

Robert P. Julius, Greenwich, Conn.; William E. Dwan, Yorktown Heights, N.Y., and Albert F. Tullar, Plainfield, Ind., assignors to Nice-Pak Products, Inc., Mount Vernon, N.Y.

Filed May 3, 1982, Ser. No. 374,613

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—339 **7 Claims**



1. A moisture impervious dispenser for housing a supply of towelettes comprising:

an open-mouthed container having an outer enclosing wall defining an interior chamber for housing the supply of towelettes, and an outwardly extending peripheral flange integral with said enclosing wall including front, rear, and side sections defining a generally planar top end surface;

a lid for closing the open-mouth of said container including a rear portion overlying said rear flange section of the container, an integral front access portion overlying the interior chamber of the container, and a generally transverse hinge positioned in proximate and overlying relation to said rear flange section of the container to permit pivotal movement of said front access portion, and unobstructed access to the interior towelette chamber; and

means for securing said rear lid portion to said rear flange section including a plurality of transversely spaced apertures extending through said rear flange section, and a plurality of corresponding spaced projections depending from said rear lid portion, said depending projections being frictionally receivable within said spaced apertures to secure said rear lid portion in locking engagement with said rear flange section.

4,428,498

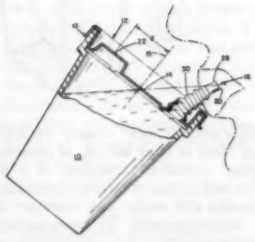
COFFEE CUP TRAVEL LID

Richard P. Obey, 5 Warden St., Apt. 16, Saugus, Mass. 01906

Filed Jun. 28, 1982, Ser. No. 392,794

Int. Cl.³ B65D *41/26, 47/32, 43/03*

U.S. Cl. 220—367 **4 Claims**



1. A lid for a disposable coffee cup, useful in place for drinking coffee while the user is moving as while riding in a vehicle, said lid having a continuous rim adapted to grip the upper rim of a disposable coffee cup and a top closing surface,

said top closing surface including a vent formation between said continuous rim and the center point of said surface,

and including a liquid port on the opposite side of said center point of said surface,

said liquid port being adapted to allow liquid to be dispensed from said cup with said lid in place,

said vent formation being disposed sufficiently away from said center point in the direction opposite of said liquid port to prevent spillage therethrough during dispensing of coffee from said liquid port,

said vent formation being defined by a side wall projecting outwardly from said top closing surface and by a top wall having a vent hole therein, the top surface of said top wall being spaced below the top surface of said rim,

said lid with said liquid port and vent formation being configured and adapted to be compactly stacked with other lids of identical form for shipment and dispensing,

the improvement wherein

said liquid port is an expansible coffee sipping port element shaped and positioned to be received by the mouth,

said expansible port element being sized and shaped to provide a conduit means from within said cup to said mouth to enable gradual flow of coffee therethrough without spillage upon tipping of the coffee cup to which it is attached,

said lid, in the condition supplied to the server of coffee, having said expansible sipping port element in vertically collapsed configuration with the upper end thereof disposed below the upper edge of said continuous rim, and

said sipping port element in said collapsed position providing clearance sufficient to enable said lid to be compactly stacked with other lids of identical form for shipment and dispensing, the top surface of said sipping port element in said collapsed position being in the same plane as the top surface of said top wall of said vent formation,

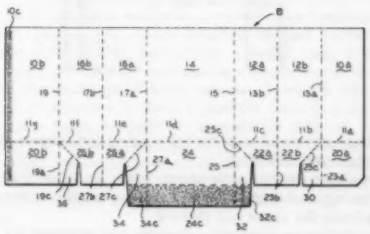
said expansible sipping port element being constructed to respond to an outward pulling action to extend above said rim to a position exposed for contact with the mouth, enabling coffee to be sipped therefrom upon tipping of said cup.

4,428,499

SIFT PROOF LINER FOR OUTER CONTAINER

James F. Naubeimer, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed May 10, 1982, Ser. No. 376,678
Int. Cl.³ B65D *90/04*
U.S. Cl. 220—470 **1 Claim**



1. A one-piece blank of foldable sheet material, such as paperboard, which is cut and scored to form a collapsible, sift-proof, leak-proof liner for an outer shipping container, said blank comprising:

(a) a first side wall complete panel located generally centrally of said blank, a bottom closure flap joined to an end edge of said side wall complete panel;

(b) a pair of second side wall panel first sections foldably joined at their inboard side edges to opposite side edges of said first side wall complete panel;

(c) a pair of second side wall panel second sections foldably joined at their inboard side edges to adjacent outboard side edges of respective second side wall panel first sections;

(d) a pair of first side wall inner and outer partial panels foldably joined at their inboard side edges to adjacent outboard side edges of respective second side wall panel second section;

(e) bottom closure flaps foldably joined to corresponding end edges of each of said first side wall partial panels on the same side of said blank as said bottom closure flaps of said side wall complete panel;

(f) pairs of first bellows elements foldably joined to corresponding end edges of each of said second side wall panel first and second sections;

(g) the first bellows elements of each pair which are joined to adjacent second side wall panel sections also being foldably joined to each other;

(h) a first pair of second bellows elements foldably joined to opposite side edges of the bottom closure flap of said first said side wall complete panel and to the first bellows elements of said second side wall first sections along diagonal fold lines, said first pair of second bellows elements each being separated along the outboard side edge thereof; from said first bellows elements of said second side wall first sections by slots;

(i) a second pair of second bellows elements foldably joined to side edges of the bottom closure flaps of said first side wall partial panels and to the first bellows elements of said second side wall second sections along diagonal fold lines, said second pair of second bellows elements each being separated along the inboard side edge thereto from said first bellows elements of said second side wall second sections by slots;

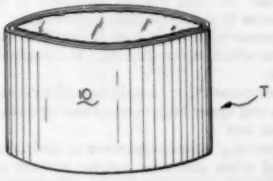
(j) a glue flap foldably joined to a common edge of said first side wall complete panel bottom closure flap and both adjacent second bellows elements and extending outwardly from the remainder of the blank beyond all of the bottom closure flaps and bellows elements.

4,428,500

AUTOMATICALLY ERECTABLE LIQUID-TIGHT TRAY

Karl A. Kohler, Roselle, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 8, 1982, Ser. No. 355,772
Int. Cl.³ B65D *3/00, 5/56, 77/06*
U.S. Cl. 220—462 **3 Claims**



1. In a collapsible, automatically erectable, liquid-tight tray, the combination of:

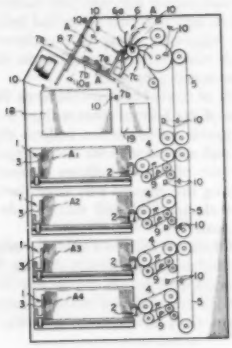
(a) an outer shell formed from a unitary blank of foldable paperboard and including a pair of opposed side wall panels foldably joined to each other at corresponding side edges to form, when in the erected position, a tubular structure open at the top;

(b) an inner shell disposed within said outer shell and including a pair of side wall panels, one of which is foldably joined at one side edge to an adjacent of one of said outer shell side wall panels;

(c) said inner shell side wall panels having lower portions interconnected by a bellows member which includes a pair of gusset elements foldably joined to each other and to respective side walls to form a collapsible bottom wall;

(d) a liquid-tight bag interposed between and secured to respective inner shell side wall panels to form a liner for said inner shell;
(e) means securing said inner and outer shell side wall panels in a fixed relationship;
(f) said bellows member being disposed above the lower edges of at least certain of said side wall panels to permit the tray to rest on said lower edges when said tray is in the erected position.

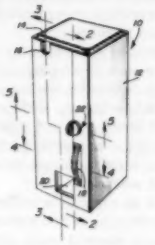
4,428,501
PAPER SHEET DISPENSER
Kyoichi Osako, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan
Filed May 28, 1981, Ser. No. 267,804
Claims priority, application Japan, May 30, 1980, 55-72545
Int. Cl.³ B65H *39/041*
U.S. Cl. 221—13 **2 Claims**



1. A paper sheet dispensing apparatus wherein a plurality of different types of paper sheets are stored in separate groups for dispensing in response to a dispensing instruction, said apparatus comprising:
(a) means for determing the number of sheets of each type to be dispensed in response to a dispensing instruction;
(b) means for adding the number of sheets of each type to provide the total number of sheets to be dispensed in response to said dispensing instruction;
(c) a memory for storing an upper limit number of paper sheets which can be dispensed in a single dispensing operation;
(d) a comparator for comparing said total number of sheets with said upper limit number and for providing an output signal; and
(e) dispensing means responsive to said comparator output signal when said total number exceeds said upper limit number for dispensing sheets of at least one given type during only a single dispensing operation so that successive dispensing operations in response to a given dispensing instruction do not include sheets of the same type.

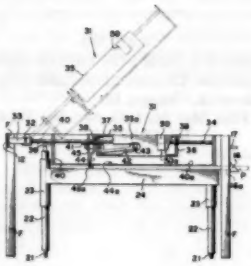
4,428,502
LOCKABLE POCKET-SIZE TABLET DISPENSING DEVICE
Douglas F. Veltri, 551 Washington St., Carlstadt, N.J. 07072
Filed Mar. 25, 1980, Ser. No. 133,880
Int. Cl.³ B23Q *7/12*
U.S. Cl. 221—152 **11 Claims**

1. A device comprising an enclosure formed by lateral wall means and having a top for covering said enclosure, a first cavity for storing a plurality of tablets in said enclosure, a second cavity adjacent to and below said first cavity and containing therein a dispensing wheel provided with at least one recess to receive at least one tablet from said first cavity, a control knob rotatably associated with said dispensing wheel, a portion of said control knob extending exteriorly from said enclosure, a chute opening into the bottom of said second cavity and extending to a discharge opening formed in one of



said lateral wall means, and a pivotable locking means being selective engageable with said control knob to enable said control knob to be rotated only when said locking means is out of engagement with said control knob and to prevent rotation of said control knob only when said pivotable locking means is in engagement with said control knob.

4,428,503
VENDING MACHINE FOR INSURING THE DISPENSING OF NEWSPAPERS AND THE LIKE ONE AT A TIME
Dennis R. Martin, Saginaw, Mich., assignor to Denmar Engineering & Control Systems, Inc., Saginaw, Mich.
Filed Dec. 7, 1981, Ser. No. 327,754
Int. Cl.³ B65G *59/02*
U.S. Cl. 221—232 **5 Claims**



5. In an improved machine for vending newspapers and the like singly and including:
a. a closed cabinet with upper, lower and side walls, and having an oblong dispensing opening in a side wall portion adjaent the upper end thereof;
b. a newspaper supporting elevator tray mounted for vertical travel in the cabinet to raise a newspaper stack progressively to dispose the topmost newspaper of a stack opposite the dispensing opening;
c. means connected to counterbalance the weight of the stack and urge the elevator tray to topmost position;
d. a dispenser assembly mounted within the cabinet at the upper end thereof and including a pusher frame mounted for reciprocatory sliding travel in a substantially horizontal plane toward and away from said dispensing opening;
e. actuator means connected with said pusher frame for effecting movement thereof;
f. an ejecting finger assembly carried by the pusher frame at the rear end thereof remote from the dispensing opening,

and including a shoe for engaging the top surface of a newspaper to be dispensed from the stack, and a dependent finger rearward thereof and at a spaced distance therebelow for engaging the rear edge of the newspaper and moving it forwardly when the pusher frame is moved forwardly;

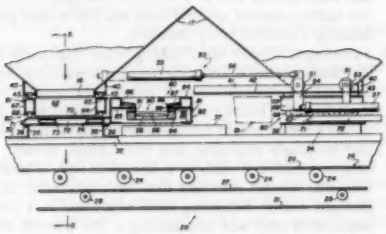
g. and means pivotally mounting the finger assembly on the pusher frame in a manner to permit a limited vertical travel thereon such that the finger can drop to a level opposite the rear edge of the next newspaper to be dispensed on the retract stroke of the pusher frame, said dispenser assembly including a frame with rear to front extending guide members on which the pusher frame is mounted for forward and retracting travel; the frame being mounted for upward movement to clear the upper end of the cabinet for the reception of a stack of newspapers; and horizontal surfaces on said frame serving as locator stops above the tray to limit upward travel of the newspaper stack and stack supporting tray.

4,428,504

DUAL-FUNCTION CARGO DISCHARGE APPARATUS

Noel L. Bassett, Grand Island, N.Y., and Henry R. King, Sturgeon Bay, Wis., assignors to American Steamship Company, Buffalo, N.Y. and R. A. Stearn, Inc., Sturgeon Bay, Wis.

Filed Dec. 2, 1981, Ser. No. 326,669
Int. Cl.³ B65G *65/02*
U.S. Cl. 222—55 **27 Claims**



1. Discharge apparatus for discharge of lump material as well as pulverulent material from a hopper having a discharge outlet, said discharge apparatus comprising: a carriage mounted adjacent to the hopper outlet and movable between first and second positions, first gate means associated with said carriage and movable independently thereof for handling lump material, second gate means mounted on said carriage and movable for handling pulverulent material, said first gate means being movable for cooperation with the hopper outlet to control the discharge of lump material therefrom when said carriage is stationary in the first position thereof, said second gate means being movable for cooperation with the hopper outlet to control the discharge of pulverulent material therefrom when said carriage is stationary in the second position thereof, and drive means coupled to said carriage for effecting movement thereof between the first and second positions thereof.

4,428,505

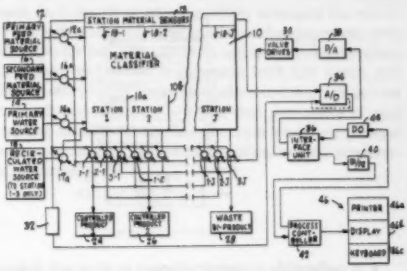
SAND CLASSIFICATION PLANT WITH PROCESS CONTROL SYSTEM

Paul G. Casey, Hinesburg, and Robert F. Dawson, South Burlington, both of Vt., assignors to Hinesburg Sand and Gravel Company, Hinesburg, Vt.

Filed May 21, 1982, Ser. No. 380,911
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—64 **12 Claims**

1. A system for controlling a plant having a material classifier fed with source material at least from a primary source and having several stations each receiving material constituents characterized by respective particle-size distributions and further having sensors detecting the presence of material at the respective stations and valves controlling the flow of material from the respective stations to at least one controlled product outlet and at least one by-product outlet comprising:

process control means responsive to signals from said sensors to open and/or close selected ones of said valves at times causing material having a selected respective particle-size distribution to flow from said classifier into each controlled product outlet; and



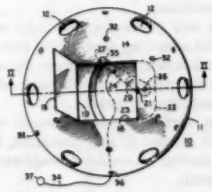
said process control means including means for monitoring selected plant operation parameters and for changing the absolute and relative open times of said valves in response to changing conditions during plant operation to maintain high flowrate of material into the at least one controlled material outlet relative to the flowrate into the at least one by-product outlet.

4,428,506

PERSONAL PROTECTION DEVICE

Edward L. Withey, 950 Andante Rd., Santa Barbara, Calif. 93105

Filed Nov. 30, 1981, Ser. No. 325,984
Int. Cl.³ B67B *7/24*
U.S. Cl. 222—80 **2 Claims**



1. A personal protection device adapted to be carried inconspicuously on the body comprising:

(a) a body member of generally flat shape having inner and outer surfaces and having a cavity formed in the outer surface and having passages leading from said cavity to at least one surface;

(b) a frangible and flexible capsule disposed in the cavity and containing a repellant fluid;

(c) a knife pivoted to the body member and having a rest position away from said cavity, and having an arc of movement across said cavity;

(d) pull cord means connected to the knife for manually moving said knife through its arc of movement;

(e) and a cap connected to said body member and covering said cavity, said cap and capsule having a size to hold the capsule stationary in the cavity so that it can be slashed when the knife is manually operated.

4,428,507

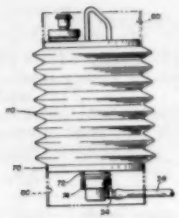
COLLAPSIBLE CONTAINER WITH ACCORDION PLEATED SIDEWALLS, AIR VENT AND SWIVEL VALVE OUTLET

Vincent R. Sneider, 3422 Hallcrest Dr., Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 265,150, May 19, 1981, abandoned. This application Jun. 21, 1982, Ser. No. 390,554

Int. Cl.³ B65D *35/08, 35/48*

U.S. Cl. 222—105 16 Claims



1. A collapsible container adapted to store and dispense fluid from the interior thereof, said container having means for controlling the fluid flow therefrom, said container including:

(a) a container of fluid impervious material and having accordion pleated side portions and having a downwardly extending boss or shoulder portion which is substantially the diameter of the inner extent of the accordion pleated side portions, said container adapted to provide a storage and discharge means and while in an empty condition the container may be manipulated to bring the sides into a pleated and stacked array providing a minimun stacked height;

(b) a top surface member integral with and forming an upper end closure of the container, said top surface member including an inlet opening for admitting fluid and a handle integrally attached to the top surface and adapted for folding flat toward and to the top surface and when swung to an erected condition providing manipulative and lifting means for the container;

(c) a latch carried by the top surface of the container and adapted to releasably engage and retain said handle in a folded condition;

(d) a valve and cover for said inlet opening, said valve adapted for admitting atmosphere into the filled container during withdrawal of fluid from the container and to be closed to the passage therethrough of fluid during other periods including agitation;

(e) a bottom surface member integral with and forming a lower end closure of said container, this bottom surface member having an outlet passageway formed and provided therein;

(f) a selective mountable swivel valve attachable to said outlet passageway, this swivel valve having two selectively movable interrelated portions with said portions in a localized contiguous relationship to each other, and when said swivel valve is mounted on the outlet passageway and the movable portion is in an attitude substantially in coincidence with the axis of the outlet passageway the swivel valve is open to fluid flow and when the movable portion of said valve is manipulated to an attitude substantially normal to the axis of said outlet passageway said swivel valve is closed to fluid flow;

(g) an external portion formed on the body of said swivel valve, this portion extending outwardly from said body and adapted for grasping by the hand of the user, and

(h) means for attaching a selected length of resilient tubing to an extending end of the swivel portion of said valve and when said valve is moved to a shut-off condition the tubing and swivel valve are in an attitude for coiling said tubing into a minimum of extending space.

4,428,508

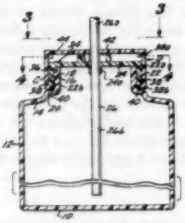
ATHLETES WATER BOTTLE

Paul T. Gardikas, 7241 Sun Breeze Dr., Huntington Beach, Calif. 92647, and Daniel W. Bailey, 2020 Tevis Ave., Long Beach, Calif. 90815

Filed Jul. 6, 1981, Ser. No. 280,323

Int. Cl.³ B67B *5/03;* B67D *5/32*

U.S. Cl. 222—153 3 Claims



1. A sanitary athletes drinking water bottle that includes:

a. an elongate container for holding said drinking water and defined by a resilient polymerized resin, said container including a bottom, a cylindrical sidewall, a top, and a wide mouthed neck projecting upwardly from said top, said neck having coarse first threads defined on the exterior surface thereof and said neck and top at their junction defining a circular body shoulder;

b. a combined closure and drinking water dispensing assembly that includes a first cylindrical sidewall that has first and second circumferential edges and coarse second threads on the interior thereof, said second coarse threads on the interior of said first cylindrical sidewall threadedly and bindingly engaging said first coarse threads when rotated relative thereto in a first direction, a transverse web that merges into said first circumferential edge, an elongate water dispensing tube supported in a centered position by said web and having a first portion that extends downwardly in said container to terminate adjacent said bottom, and a second portion that extends upwardly a substantial position above said top, a visual insignia defined on the upper surface of said web, and transverse slot defining means that extend upwardly from said web and to one side of said tube;

c. a guard that includes a second cylindrical sidewall that rotatably engages said first sidewall, said second sidewall having first and second circumferential edges, a circular lip that projects inwardly from said second circumferential edge of said second sidewall under said second circumferential edge of said first sidewall and slightly above said body shoulder to act as a stop to prevent forceful removal of the guard from said combined closure and drinking water assembly by an athlete, a transverse top that merges into said first circumferential edge of said second cylindrical sidewall, said top having a centered opening therein through which said water dispensing tube extends upwardly, a transverse opening in said second sidewall that may be axially aligned with said slot defining means and a recess on the interior of said second sidewall, and an aperture in said top which when said insignia is visable therethrough visually indicates said opening, recess and slot defining means are axially aligned; and

d. a rigid elongate member that may be removably inserted through said transverse opening, slot defining means to engage said recess to twist said combined closure and drinking water assembly in said first direction to force said first and second coarse threads into frictional wedging engagement, with said elongate member then being removed, and an athlete thereafter only able to dispense water from said tube as a jet into his mouth by laterally

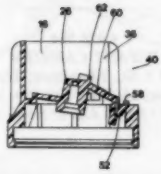
squeezing said cylindrical sidewall, as rotation of said guard will have no effect in loosening said combined closure and drinking assembly to permit same to be removed from said neck to permit the athlete to drink therefrom.

4,428,509

DISPENSING DEVICE FOR CONTINUOUS AEROSOL

Kenneth R. Emerson, and Diane Haworth, both of Racine County, Wis., assignors to S. C. Johnson & Sons, Inc., Racine, Wis.

Filed Apr. 1, 1982, Ser. No. 364,565
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—153 **7 Claims**



1. A dispensing device adapted for continuous dispensing from an aerosol container of the type having a stem protruding from one end thereof, comprising:

a skirt having a lower edge adapted for attachment to such a container in positions surrounding the stem;

an actuator button hinged to the skirt and extending across the stem, said button defining a stem-engaging socket and a discharge orifice in fluid communication therewith;

said skirt extending upwardly from along a major circumferential portion of its lower edge to provide a recess for the button and defining a gap for finger access to the button; and

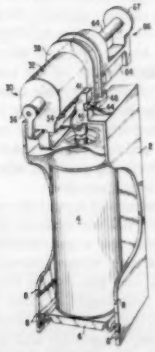
a removable tab substantially covering the gap, said tab connected by connector means to the skirt and to the button, at least said connector means to said button being frangible.

4,428,510

ACTIVATING DEVICE FOR A PRESSURIZED CAN

Ney M. Iglesias, 1070 Fanny St., Elizabeth, N.J. 07201

Filed Sep. 25, 1981, Ser. No. 305,529
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—180 **3 Claims**



1. A dispensing device for a pressurized container having a valve for expelling the contents thereof, said dispensing device having a housing means for holding said container in operating position, and pneumatic means for activating said valve for a predetermined period of time, wherein said pneumatic means comprises:

a. a body portion having an interior cavity containing air;

b. a plunger means arranged for movement relative to said interior cavity for displacing a predetermined quantity of said air; and

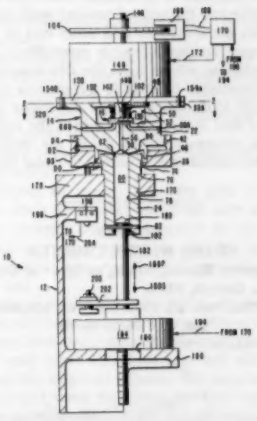
c. orifice means for metering said displacing of said predetermined quantity of air thereby controlling the rate of said movement of said plunger means, wherein said pneumatic means includes an actuating member arranged for movement in a first direction into operational engagement with said valve for actuation thereof, and in a second direction out of said operational engagement with said valve, and wherein said plunger means includes a cam surface carried therewith and arranged to effect said movement of said actuating member in said first direction when said plunger porton partakes of said sliding motion in said predetermined direction.

4,428,511

FLUID HANDLING APPARATUS HAVING A FLUID METERING VOLUME THEREIN

Gary W. Howell, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1981, Ser. No. 296,850
Int. Cl.³ B65D *88/54*
U.S. Cl. 222—309 **9 Claims**



7. A fluid handling device comprising:

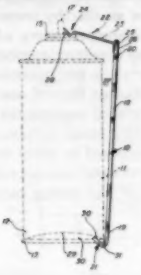
a stator having a planar surface, at least two fluid passages terminating at the planar surface, and an arm having a slot therein;

a seal member having a slot therein, the seal being rotatably disposed with respect to the surface of the stator;

means connected to the seal for rotating the same with respect to the planar surface to alternatively isolate the passages from each other or to permit communication between the passages through the slot in the seal member,

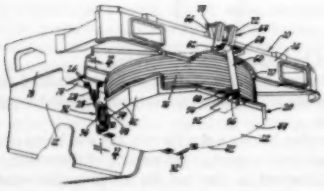
the rotating means having a pin thereon, the rotating means being movable in a first direction wherein the pin is engaged within the slotted arm to secure the rotating means to the stator and movable in a second direction wherein the pin is disengaged from the slotted arm to permit removal of the rotating means from the stator.

4,428,512
SPRAY NOZZLE ACTUATOR
Frank J. Nosek, 28 W. 715 Mount St., Warrenville, Ill. 60555
Filed Jul. 15, 1982, Ser. No. 398,675
Int. Cl.³ B65D *83/06*
U.S. Cl. 222—402.15 **16 Claims**



1. An actuator for use with an aerosol container having a first end defining a first annular wall, an opposite second end having a tilt-actuatable valved spray nozzle and a second annular wall concentrically about said nozzle, said actuator comprising:
a depressor bar;
a first hook at one end of the bar configured to hook about the container first annular wall; and
a second hook at the opposite end of the bar including a spring finger projecting from the bar and having a distal retainer configured to be captured between the container spray nozzle and the second annular wall, and a connecting portion connected to said other end of the bar, said spring finger having a length preselected to cause the depressor bar to extend from the first annular wall away from the container to provide a clearance space therebetween such that urging of the depressor bar pivotally about said first annular wall toward the container to reduce said clearance space urges the retainer laterally against the valved spring nozzle to cause tilted actuation thereof.

4,428,513
SPARE WHEEL CARRIER
John A. Delmastro, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1982, Ser. No. 444,694
Int. Cl.³ B62D *43/04*
U.S. Cl. 224—42.21 **2 Claims**



1. A spare wheel carrier for stowing spare wheels of different thickness generally horizontally under a vehicle comprising, in combination,
a support member receiving the spare wheel,
spaced pivots depending from the vehicle and defining an axis of rotation adjacent one end of the support member,
spaced bracket means on the support member adjacent the one end thereof, each including a slot having upper and lower ends alternately engageable by a respective pivot to mount the support member to the floor member for pivotal movement between an upper generally horizontal position and a pivoted lower position wherein the support member and tire are located angularly to the horizontal,
the engagement of the pivots with the upper ends of the slots spacing the support member in a first position a sufficient distance from the floor member to house a maximum thickness spare wheel, and the engagement of the pivots with the lower ends of the slots spacing the support member in a second position a lesser distance from the floor member sufficient to house a lesser thickness spare wheel,
and cooperating means between the vehicle and the other end of the support member for locating such other end relative to the one end to maintain the support member generally horizontal in each upper position thereof.

4,428,514
INFANT CARRIER
Jennifer L. Elf, 1103 A St., Ellensburg, Wash. 98926
Filed Dec. 14, 1981, Ser. No. 330,124
Int. Cl.³ A47D *13/02;* **A47C** *31/00*
U.S. Cl. 224—151 **10 Claims**

1. A convertible seat and cradle carrier for an infant having a sheet body including a back panel, a bib panel and a seat panel connecting the back panel and the bib panel, first two disengageable connection means carried by opposte sides of the body, respectively, adjacent to the junction of the back panel and the seat panel and two supporting straps each having one end secured permanently to the body and a free end, the improvement comprising the back panel, the bib panel and the seat panel being disposable in coplanar relationship to form the body as a flat sheet, spanning strap means carried by said supporting straps and connectible with the edge portion of the bib panel remote from the seat panel to form the sheet body as a return bent pouch with the free ends of the supporting straps secured, respectively, to the first two disengageable connection means to carry the weight of the pouch and an infant therein, and second two disengageable connecting means carried by a portion of the bib panel remote from the seat panel and connectible, respectively, to the free ends of the two supporting straps to form and support the sheet body as a sling for carrying an infant in reclining position wherein said spanning strap means are in a nonuse position.

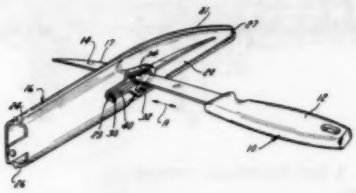
2. A carrier for an infant and mountable on an intended user comprising a length of flexible material having a back end portion, a bib end portion and a central portion therebetween, two elongated flexible first straps extending from one end portion of said length, first attachment means carried by the other end portion of said length, second attachment means carried by said central portion of said length, said first straps having free end portions connectible alternatively to either of said first and second attachment means such that said two first straps, in combination with said length, form closed shoulder loops for mounting the carrier on the intended user, and two elongated flexible second straps connectible to said length so as to extend generally across the opposite ends of said length to

form, in combination with said length, closed loops defining a cavity for receiving the infant.

4,428,515
KNIFE SCABBARD WITH INTEGRAL BLADE SHARPENER

Paul C. Mayer, Rothschild, Wis., assignor to Oy Fiskars AB, Helsinki, Finland

Filed Apr. 26, 1982, Ser. No. 371,654
Int. Cl.³ B26B *29/02*
U.S. Cl. 224—232 **7 Claims**



1. In combination:

a knife scabbard having a pair of spaced apart walls enclosing an elongated recess for receiving and protecting the blade of a knife carried by said scabbard;

and knife blade sharpening means on said scabbard and comprising:

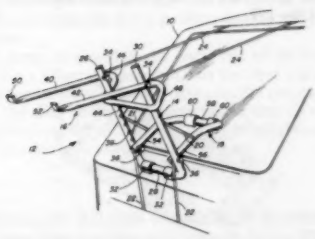
a blade-receiving sharpening slot in said scabbard defined by a pair of registering holes in said scabbard walls, said slot having an axis transverse to the longitudinal axis of said scabbard;

and blade sharpening abrasive means on said scabbard near said sharpening slot for sliding engagement with the edge of a knife blade being moved in said sharpening slot to effect sharpening thereof.

4,428,516
COLLAPSABLE BICYCLE CARRIER

Richard A. Allen, Lewis St., Lincoln, Mass. 01773

Filed Jan. 21, 1982, Ser. No. 341,303
Int. Cl.³ B60R *9/10*
U.S. Cl. 224—314 **12 Claims**



1. A folding carrier mountable on an automobile or the like, said carrier comprising:

(a) frame means;

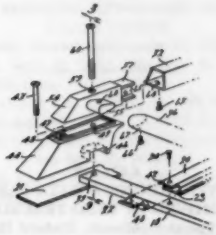
(b) a carrying member pivotally mounted to said frame means at a first end portion thereof, said carrying member constrained for limited rotational movement by said frame means between an extended position and a collapsed position, said carrying member and said frame means are substantially in side-by-side relationship when said carrying member is in its collapsed position; and

(c) a supporting member pivotally mounted to said frame means at a second end portion thereof, said supporting member movable between an extended position and a collapsed position, said supporting member and said frame means are substantially in side-by-side relationship when said supporting member is in its collapsed position, said first end portion and said second end portion at opposite end portions of said frame means.

4,428,517
VEHICLE LUGGAGE RACK

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 204,478, Nov. 6, 1980, Pat. No. 4,342,411, which is a continuation of Ser. No. 13,524, Feb. 21, 1979, abandoned. This application Jul. 26, 1982, Ser. No. 401,745
The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.
Int. Cl.³ B60R *90/04*
U.S. Cl. 224—326 **23 Claims**



12. A stanchion assembly for an automotive vehicle luggage carrier, comprising

a lower stanchion part adapted to be fixedly secured to a mounting surface on the associated vehicle by first fastening means comprised of at least one fastening element extending through a generally vertically-arranged opening in said lower stanchion part,

a pad disposed between said lower stanchion part and said mounting surface,

also comprising an upper stanchion part adapted to be mounted upon said lower stanchion part and having at least one exterior surface disposed in substantially the same plane as at least one of the exterior surfaces of said lower stanchion part, and thereby conceal said fastening element, and

second fastening means for detachably securing said upper stanchion part of said stanchion assembly to the associated lower stanchion part, including flange means interacting between said upper stanchion part and said lower stanchion part and disposed adjacent the periphery of the top portion of said lower stanchion part and engageable with the lower portion of said upper stanchion part, said flange means being totally concealed when said upper stanchion part is disposed in engagement with said lower stanchion part.

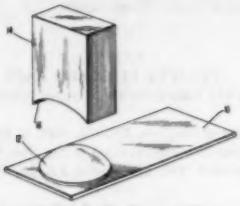
4,428,518
GLASS BREAKING TOOL

Donald Abel, Morton, Ill., assignor to Morton Glass Works, Morton, Ill.

Continuation-in-part of Ser. No. 201,719, Oct. 29, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 312,181
Int. Cl.³ C03B *33/04, 33/12*
U.S. Cl. 225—103 **22 Claims**

1. A tool for fracturing glass along a score line comprising a base having a surface which is convexly curved in all directions from a central axis, the surface forming a fulcrum element wherein said fulcrum element makes point contact with the

glass opposite the score line, and a pressure block with a concavely curved planar lower surface having a generally similar radius of curvature as the fulcrum element, wherein the pressure block contacts the glass on opposite sides of the score line such that a force exerted on the pressure block toward the fulcrum element causes the glass to fracture at the score line.



4,428,519

DEVICE FOR TENSIONING A DATA CARRIER WHICH IS MOVED BY FEED TRACTORS

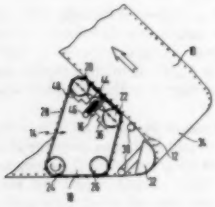
Helmut Reichl, Fuerstenfeldbruck; Richard Hartl, Germering, and Christoph Newinger, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,020

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127777

Int. Cl.³ B65H *17/38*; G03B *1/30*

U.S. Cl. 226—75 **6 Claims**



1. In a device for transporting a sheet data carrier having first and second feed tractors, said data carrier being transported through a curved zone disposed between said first and second feed tractors, the improvement of a means for uniformly tensioning said data carrier in said curved zone comprising:

guide rails disposed parallel to the direction of transport of said data carrier on which at least one of said feed tractors is displaceably mounted;

a bearing element connected to said feed tractor which is mounted on said guide rails; and

a cam mounted on a rotatable shaft and abutting said bearing element such that said feed tractor which is mounted on said guide rails is displaced in a direction parallel to the direction of transport of said data carrier upon rotation of said cam and shaft thereby adjusting the tension of said data carrier in said curved zone.

4,428,520

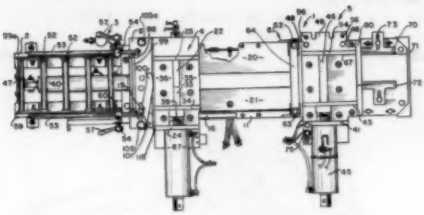
FEED MECHANISM FOR A POWER TOOL

Curtis J. Eccardt, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 10, 1982, Ser. No. 356,653

Int. Cl.³ B65H *17/26*

U.S. Cl. 226—141 **22 Claims**



1. A feed mechanism, comprising:

a bed;

a first vise supported by said bed;

a second vise supported by said bed and movable thereon between at least first and second positions;

means associated with said second vise for accommodating non-planar work pieces;

means associated with said first vise for adjusting at least one of the pair of jaws forming said vise to enable the jaws of said vise to be set square;

means for adjusting the length of travel for said second vise including a first coarse adjustment and a second fine adjustment; and

control means for operating said feed including a control manifold having a plurality of control devices mounted to it, and a plurality of input and output ports positioned on said manifold and adapted to control operation of said feed through said manifold.

4,428,521

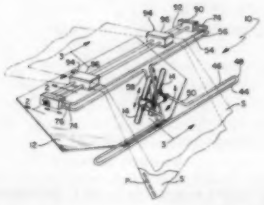
MULTI POSITION SHEET GUIDE

Lesley S. Rich, 1109 Prospect St., Somerset, Mass. 02726, and Richard Skurka, Fall River, Mass., assignors to Lesley S. Rich, Somerset, Mass.

Filed Feb. 26, 1982, Ser. No. 352,594

Int. Cl.³ B65H *23/32*; G03B *1/50*; B65H *27/00*

U.S. Cl. 226—199 **12 Claims**



1. A device for positioning an edge perforated sheet in an exit and/or feed path with respect to a printer or the like for guiding said sheet while exiting and/or entering said printer, said device comprising a base including and upwardly generally vertically extending main support, bracket means connected to said main support, said bracket means in turn supporting separate first and second sheet guides for independent height and rotational movement, said first and second generally vertically spaced upper and lower guides each including a pair of laterally extending, generally parallel sheet support

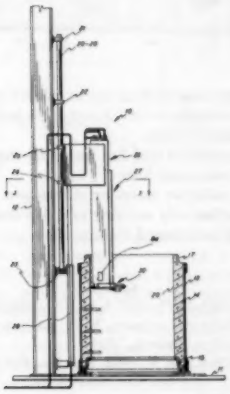
elements, said second guide further including sheet edge guide support means positioned forwardly of said second guide support elements and in turn adapted to support a pair of sheet edge guides in laterally spaced and adjustable positions at the lateral edges of said sheet path.

4,428,522

STEP DRIVER

Robert C. Buttner, Syracuse, N.Y., assignor to Concrete Pipe & Products Corp., East Syracuse, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,737
Int. Cl.³ B27F *7/02*
U.S. Cl. 227—8 **12 Claims**



1. Apparatus for driving steps into a precast riser section that is supported in an upright position within a jacket that includes

a stationary support column for movably supporting a carriage for movement back and forth over a vertical path of travel between a raised home position and a fully extended lowermost position,

means for positioning a precast riser in an upright position adjacent to the stationary column whereby the column is located on the outside of the riser,

an elongated bracket suspended from the carriage that is arranged to pass downwardly into the riser as the carriage is lowered from the home position toward the lowermost position,

a slide means mounted in the distal end of the bracket for moving a bifurcated member into the riser wall, and

control means for sequentially indexing the carriage to position the slide means at predetermined step locations and reciprocating the slide means to drive the bifurcated member into the wall at each step location.

4,428,523

METALLIC SOLDER COMPOSITE BONDING

Elias Snitzer, West Hartford, and James F. Bacon, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 215,283, Dec. 12, 1980, Pat. No. 4,350,744. This application Jan. 11, 1982, Ser. No. 338,823
Int. Cl.³ B23K *31/02*; C03C *27/04*; B32B *17/06*
U.S. Cl. 228—121 **7 Claims**

1. A process of bonding a plurality of thermally stable high strength graphite fiber reinforced glass matrix composite materials together comprising applying to all of the bond surfaces of the composite materials to be bonded comprising multiaxially oriented or discontinuous graphite fiber reinforced glass matrix composite materials containing about 40% to about 70% by volume graphite fibers, at least one thin layer of an oxidatively stable metal which is strongly adherent to the composite material and an appropriate solder, placing a solder layer between the bond surfaces of the composite materials and heating the

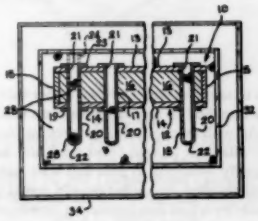
composite materials to melt the solder and form the bond, the melting temperature of the metal and solder being higher than the use temperature of the bonded composite.

4,428,524

METHOD OF FORMING APPARATUS FOR FORMING GLASS FIBERS

Mohinder S. Bhatti, Newark, and James M. Higginbotham, Sr., Reynoldsburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 255,984, Apr. 20, 1981, Pat. No. 4,342,578. This application May 14, 1982, Ser. No. 378,150
The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.
Int. Cl.³ C03B *37/025*; B23K *1/00*
U.S. Cl. 228—170 **5 Claims**



1. A method of making a feeder for supplying streams of molten glass to be attenuated into filaments comprising:

assembling a plurality of layers of material wherein one of said layers is a refractory metal and another of said layers is a precious metal, said plurality of layers having a plurality of apertures extending therethrough;

inserting elements in said apertures to form a loose assembly;

isostatically pressing said loose assembly;

heating the isostatically pressed assembly to intimately bond the plurality of layers and the elements to form a unitary laminate; and

forming an orifice in said elements to permit the molten glass to issue therefrom as said streams, said precious metal layer and said elements preventing the oxidation of said refractory metal layer at elevated temperatures.

4,428,525

EASY ACCESS SANDWICH CARTON

Arne H. Brauner, Peekskill, N.Y., assignor to International Paper Company, New York, N.Y.

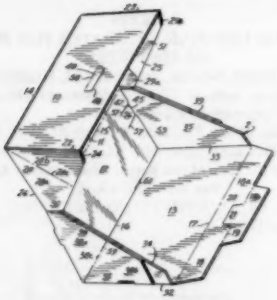
Filed Aug. 9, 1982, Ser. No. 406,748
Int. Cl.³ B65D *5/36, 5/24*
U.S. Cl. 229—41 R **1 Claim**

1. A folding carton consisting of

(A) a lower portion having a substantially "V" shaped cross section comprising a bottom wall, a rear wall hingedly attached thereto, and two lower side walls hingedly at-

tached to said bottom and rear walls; each of said side walls comprising an inner lower flap hingedly attached to said bottom wall and an outer lower flap hingedly attached to said rear wall, said outer lower flap being divided into substantially equal glue and non-glue panels by a fold line extending upwardly from the intersection of said outer lower flap and said bottom and rear walls, said glue panel being the panel relatively more remote from the line of attachment of said outer lower flap to said rear wall and said outer lower flap being secured to said inner lower flap only at said glue panel; said inner lower flap bearing a tab adapted to be cooperatively engaged in a slit sited about at the fold line connecting said rear wall and said outer lower flap; and

(B) an upper portion having a substantially "V" shaped cross section, comprising a top wall hingedly attached to the rear wall of said lower portion, a front wall hingedly



attached to said top wall and two upper side wall portions hingedly attached to said front and top wall, each of said upper side wall portions comprising an inner upper flap hingedly attached to said front wall and an outer upper flap hingedly attached to said top wall, said outer upper flap being divided into substantially equal glue and non-glue panels by a fold line extending downwardly from the intersection of said outer upper flap and said top and front walls, said glue panel being the panel relatively more remote from the line of attachment of said outer upper flap to said top wall and said outer upper flap being secured to said inner upper flap only at said glue panel; said lower side walls extending partially inside said upper side walls in the erected and closed carton; said bottom wall having a flap hingedly extending therefrom on the front edge thereof, said flap having a "U" shaped slit therein adapted to form a reverse tab cooperatively engageable in a corresponding slot in said front wall.

4,428,526

REPLY CARD ARRANGEMENT WITH CONFIDENTIALITY FLAP

James E. Riley, Deerfield, Ill., assignor to The Wessel Company, Inc., Elk Grove Village, Ill.

Filed Feb. 24, 1982, Ser. No. 351,923
Int. Cl.³ B42D *15/08*
U.S. Cl. 229—92.8 **6 Claims**

1. A reply card arrangement comprising:

a first sheet portion having a pair of spaced-apart sides;

a second sheet portion having a pair of spaced-apart sides;

said first sheet portion being in superimposed relation to said second sheet portion and joined thereto at a fold line along a mutual first side of each sheet portion;

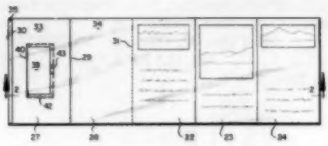
at least one other sheet portion;

means detachably joining said other sheet portion to said second sheet portion at a tearable connection along a second side of said second sheet portion;

each of said first and second sheet portions having an inside surface in mutually facing relation;

first adhesive means, on the inside surface of one of said first and second sheet portions, adhesively securing together the first and second sheet portions adjacent the second side of each;

discontinuous score lines on said first sheet portion defining



flap means raisable from the remainder of said first sheet portion to expose to view a part of the inside surface of the second sheet portion;

the inside surface of said flap means having a marginal part adjacent said score lines;

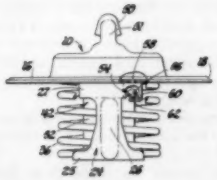
and second adhesive means on at least part of said marginal part for adhesively securing said flap means to the inside surface of said second sheet portion.

4,428,527

THERMOSTATIC VALVE ASSEMBLY

Franklin A. Daigler, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1982, Ser. No. 416,142
Int. Cl.³ F01P *7/02*
U.S. Cl. 236—34.5 **3 Claims**



3. In a thermostatic valve assembly for a fluid system requiring venting as well as temperature controlled flow wherein the assembly comprises a mounting flange, a frame having the characteristic that it can be formed from flat sheet stock so as to attach with a pair of integral arms to the frame and together therewith support a spring biased thermally actuated flow valve, and a ball vent valve element that opens to vent one side of the flange to the other through a hole therein and closes same in response to pressure differential: the ball vent valve element comprising an improved retainer comprising a first extension integral with and extending from one arm of the frame and a second extension integral with and extending from said first extension, both said extensions being configured so as to be formed together with the frame from flat sheet stock with said first extension thereafter formable to extend circularly partially about the hole and leave a first gap at the end of said first extension and said second extension then formable after insertion of the ball vent valve element within said first formed extension to extend partially over an otherwise open end of the latter and leave gaps along opposite edges of second extension whereby said extensions cooperate as part of the frame and with the flange to retain the ball vent valve element in seating relationshp with the vent hole and without substantially restricting venting therethrough when the vent hole is opened thereby by the provision of said gaps.

4,428,528

ENVIRONMENTAL THERMOSTAT ASSEMBLY

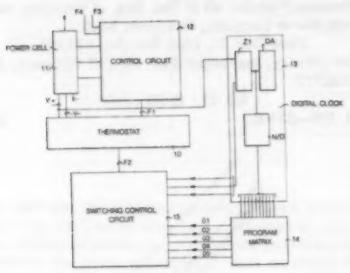
Joel E. Renault, Saint-Gregoire, France, assignor to Delta Dore S.A., Combourg, France

Filed Nov. 4, 1982, Ser. No. 439,111

Claims priority, application European Pat. Off., Nov. 12, 1981, 81401787.7

Int. Cl.³ F23N 5/20; G05D 23/00

U.S. Cl. 236—46 R 9 Claims



1. An environment thermostat assembly with a daily programming device, comprising a thermostat, a digital clock with a seven segment display device, a programming selecting circuit with two temperature reference values, a reference value switching device, and a control circuit for controlling the switching circuit, said control circuit being monitored by the digital output signal of the digital clock and by the program selecting circuit, wherein the control circuit comprises a digital/decimal converter for converting the hour unit digital data into a one out of ten code signal, the ten outputs of the converter (N/D) being connected to the vertical wires of a cross-point matrix having three pair of output wires, the output pairs being respectively assigned to the hours of which the tenth figure is 2, 1 and 0, said outhas also a number of inputs connected to the active outputs of the clock when the hour tenth figures is 1 or 2, respectively, some cross-points of the matrix being selectively connected in accordance with the different predetermined programs, electronic contacts being mounted on the output wires of the matrix and controlled by the program selecting circuit, the output of the logical circuit being connected to a reference value adjusting potentiometer, the voltage transmitted to said potentiometer through the output of the logical circuit varying between two values in accordance with the logical levels of the outputs of the logical circuit.

4,428,529

FLOW SYNCHRONIZATION

Louis J. Bentsen, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 26, 1982, Ser. No. 401,507

Int. Cl.³ F24F 13/10

U.S. Cl. 236—49 16 Claims

1. A system for controlling the static pressure within a controlled space, the controlled space having supply duct means for providing air to the space and return duct means for exhausting air from the controlled space, the system comprising:

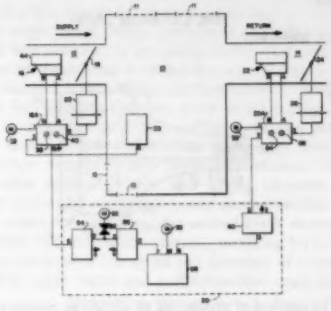
first air flow sensor means mounted in the supply duct means for sensing the amount of air moving through the supply duct means;

first air flow control means connected to the first air flow sensor means for controlling the amount of air moving through the supply duct means;

second air flow sensor means mounted in the return duct means for sensing the amount of air moving through the return duct means;

second air flow control means connected to the second air flow sensor means for controlling the amount of air moving through the return duct means;

one of the first or second air flow control means comprising minimum/maximum control means having a single adjustment for controlling either the minimum flow rate or the



maximum flow rate in both duct means simultaneously; and

adjust means connected to the minimum/maximum control means for adjusting the amount of air being supplied to the controlled space.

4,428,530

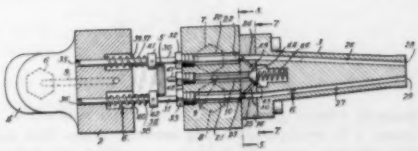
METHOD AND GUN FOR IN SITU FORMATION OF FOAM IN PACKAGES

Paul R. Chabria, 3 N. 735 Locust, West Chicago, Ill. 60185

Filed Dec. 12, 1977, Ser. No. 859,553

Int. Cl.³ B05B 13/00

U.S. Cl. 239—8 1 Claim



1. The method of delivering potentially reactive foam-forming liquid components into a package container and forming plastic foam in situ within said container which comprises the steps of supplying said liquid components to respective separate channels of a gun having flow control valves for the respective channels, directing the streams of liquid flowing through the respective channels to converge as discrete liquid streams at a point in space exteriorly and forwardly of said gun to mix and initiate reaction of said components at said point whereafter the reacting mixture continues to flow in a stream into said container, supplying a stream of gas to the gun for eventual mixing with the foam-forming liquid components, the flow of said stream of gas being continuous during both open and closed positions of the valves within said gun, and manipulating the gun to close the valves to stop the flow of component liquids and thereafter supplying additional inert gas in streams to the respective liquid flow channels downstream of said valves to purge said channels of liquid.

4,428,531

METHOD OF PRODUCING A FUEL INJECTOR

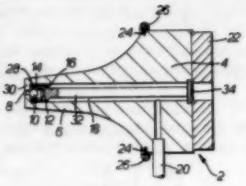
Barrie J. Martin, Shenfield, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 19, 1980, Ser. No. 179,425

Claims priority, application United Kingdom, Sep. 11, 1979, 7931505

Int. Cl.³ B05B *17/06*

U.S. Cl. 239—102 **4 Claims**



1. The method of producing an ultrasonic nozzle comprising the steps of:

(a) providing a nozzle body having an inner passageway terminating in a valved orifice at one end thereof and securing to the other end means operable for generating ultrasonic vibrations;

(b) disposing a valve housing within said passageway and positioning said housing over said orifice valve and spacing said housing from said orifice;

(c) disposing an elongated member in said housing and securing said housing to said member at one end thereof; and,

(d) securing the opposite end of said elongated member to said body at a location remote from said valved orifice.

4,428,532

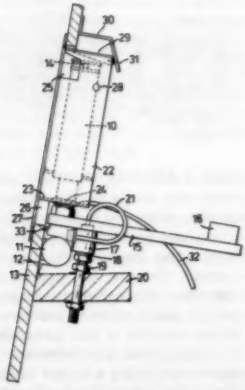
SPRAY APPARATUS

Gary Holden-Parker, "Louvain", Quavey Road,, Redlynch, Wiltshire, England

Filed Dec. 8, 1981, Ser. No. 328,614

Int. Cl.³ B05B *15/10*

U.S. Cl. 239—204 **11 Claims**



1. Spray apparatus comprising a spray or sprinkler unit provided with a pivot mounting, means for moving the spray or sprinkler unit about said pivot mounting, a housing surrounding said unit and in which the unit is received, and means for pivotally moving the spray or sprinkler unit with respect to the housing, said means for moving the spray or sprinkler unit when initially activated causing said spray or sprinkler unit and said housing to pivot together about said pivot mounting, with further actuation of said means for moving causing said spray or sprinkler unit to pivot with respect to said housing.

4,428,533

WINDSHIELD WIPER SHAFT BUSHING ASSEMBLY WITH WASHER JET

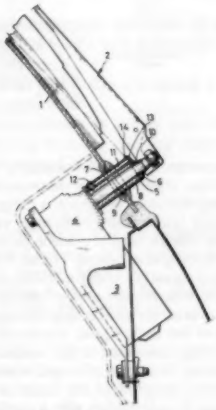
Erwin Pietryk, Cologne; Peter Fischer, Langenfeld, and Axel Rauthmann, Pulheim, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1981, Ser. No. 333,191

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102573

Int. Cl.³ B05B *15/06*

U.S. Cl. 239—284 R **1 Claim**



1. A wiper shaft bushing assembly with a washer jet for motor vehicle screens in which the wiper shaft is guided in a wiper bushing and is surrounded by an elastic plastic sleeve in which a washer jet is located, wherein the improvement comprises:

a one-piece plastic sleeve that eccentrically surrounds the wiper bushing and the elongated wiper shaft and which has formed in its wall located farthest from the wiper shaft a liquid channel which is connected on its inner end to a lateral tube connection and on its outer end to a ball socket for receiving a spherical directable nozzle body and which has formed at its outer end an annular sealing lip for sealing off the wiper shaft guided therein.

4,428,534

METHOD OF IMPROVING THE UTILIZATION OF THE HEAT ENERGY PRODUCED IN A WOOD GRINDING PROCESS

Ari A. M. Maijala, Tampere, and Matti I. Aario, Pirkkala, both of Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Nov. 2, 1981, Ser. No. 317,642

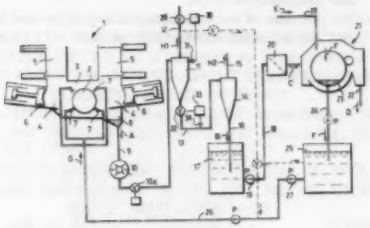
Claims priority, application Finland, Nov. 18, 1980, 803599

Int. Cl.³ B02C *11/08, 23/24*

U.S. Cl. 241—18 **6 Claims**

1. A method of improving the utilization of the heat energy produced in a wood grinding process of the type in which wood is ground by means of a rotating grinding member in a grinding space under superatmospheric pressure while warm shower water is sprayed into the grinding space, and the groundwood pulp is fed from the grinding space into steam separator means wherein the heat energy contained in the groundwood pulp is released in the form of steam, which

method is characterized by the fact the groundwood pulp discharged from the pressurized grinding space is allowed to expand from its inlet pressure to atmospheric pressure in at least two steam separators by releasing steam from the pulp suspension in each steam separator by lowering the pressure



therein, and that the temperature and pressure of the steam released from each steam separator is adjusted to correspond to steam utilization needs, the groundwood pulp being allowed to expand in the steam separators to such an extent that the pulp suspension temperature is decreased in the last steam separator to about 100° C.

4,428,535

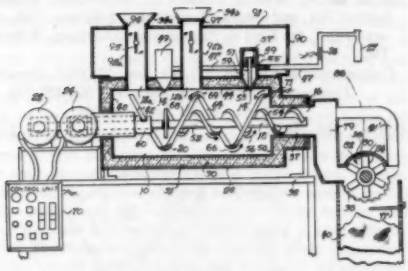
APPARATUS TO COOL PARTICULATE MATTER FOR GRINDING

Jim M. Venetucci, Forest Park, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Jul. 6, 1981, Ser. No. 280,882

Int. Cl.³ B02C *13/286*

U.S. Cl. 241—35 **21 Claims**



1. Apparatus for mixing and cooling particulate material comprising

an elongated mixing chamber having particulate material inlet means, cryogenic liquid inlet means connected to a supply of cryogenic liquid and disposed downstream of said particulate material inlet means to spray cryogenic liquid on the particulate material, and particulate material outlet means at the downstream end of said chamber through which cooled particulate material is delivered,

feed auger means having a shaft and a blade supported thereby, said feed auger means being disposed in said chamber and rotatable about an axis to move cooled particulate material through said chamber and through said outlet means,

intromitter auger means coaxial with said feed auger means having a shaft rotatable independently of the rotation of said feed auger shaft and a blade supported by said intromitter auger shaft and disposed around said feed auger blade,

first variable speed drive means connected to said feed auger shaft to rotate the same,

second variable speed drive means connected to said intromitter auger shaft to rotate the same, said second variable speed drive means being operable to rotate said intromitter auger means in either rotational direction,

a first surface of said intromitter auger blade being configured to move particles within said chamber in a downstream direction when said intromitter auger shaft is rotated in a first direction and a second surface of said intromitter auger blade being configured to move particles within said chamber in an upstream direction when said intromitter auger shaft is rotated in a second direction, and

control means is connected to said first variable speed drive means for operating said first drive means during certain times at a desired feed rate and for operating said first drive means during other times to prevent feeding of particulate material when additional residence time of particulate material within said mixing chamber is required, and is also connected to said second variable speed drive means for operating said second drive means independently of said first drive means, providing for independent adjustment of the speed and direction of rotation of said feed auger means and said intromitter auger means.

4,428,536

PULVERIZING AND CLASSIFYING MILL

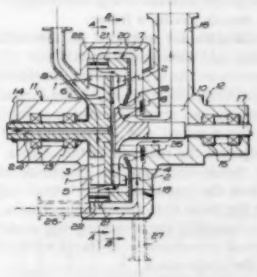
Jeffrey C. Rodgers, Hoylandswaine, England, assignor to British Rema Manufacturing Co., Limited, England

Filed Oct. 25, 1980, Ser. No. 202,355

Claims priority, application United Kingdom, Oct. 30, 1979, 7937566

Int. Cl.³ B02C *13/284, 13/286, 23/12*

U.S. Cl. 241—52 **6 Claims**



1. A classifier mill comprising a casing, beaters disposed within said casing mounted about a periphery of a rotary pulverizer disc within a chamber of the casing, with first and second series of beaters on respective sides of the periphery of the disc, and with an independently rotary classifier coaxial with the pulverizer disc and disposed radially inwards in relation to the second series of beaters on an adjacent side of the disc, an entry for material to be pulverized being provided into the chamber at a position intermediate the axis of the pulverizer disc and the first series of beaters on the side remote from the classifier, and an exit for the removal of fines being provided coaxially with the classifier and remote from the pulverizer, an annular wall disposed within the chamber extending radially outwards from clear of the periphery of the classifier to a position intermediate the periphery of the second series of beaters of the pulverizer and the casing, and a cylindrical wall extending from the annular wall axially within the casing past the peripheries of both series of beaters, the cylindrical wall being provided with a series of circumferentially spaced screening means disposed radially outwards with respect to only the first series of beaters and communicating with a flow passage within the casing partially defined by the annular and cylindrical walls, the flow passage extending radially inward

to the classifier and being isolated from the second series of beaters, the classifier being operative to direct only selective components of a material pulverized by the first series of beaters to the second series of beaters.

4,428,537

APPARATUS FOR THE REMOVAL, LOADING, CONVEYING, PREPARATION AND DISTRIBUTION OF ANIMAL FOOD

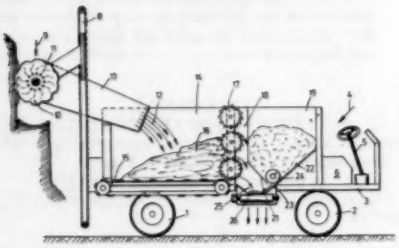
Hans von der Heide, Ibbenbürener Str. 17, 4533 Laggenbeck, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,278

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033824

Int. Cl.³ B02C *21/02*

U.S. Cl. 241—101 B **8 Claims**



1. A self-propelled apparatus for preparation and distribution of a composite animal food comprising:

a vehicle chassis having a frame,

self-propulsion means mounted on the vehicle chassis for propelling and driving the chassis,

steering means on the vehicle chassis for steering the same as it is being driven by the propulsion means,

a comminuting and removing means at the rear end of the chassis for removal and comminution of silage from a stack adjacent the rear end of the chassis,

a loading means receiving the comminuted and removed silage from the comminuting and removing means and for loading the same onto the vehicle chassis,

means for mounting the removing and comminuting means for vertical movement to different vertical positions relative to the silage stack,

a food product compartment on the chassis for holding a food product to be combined with the silage to form a composite animal food,

means on the vehicle chassis for milling and metering and disintegrating the silage,

means for conveying and discharging the food product from the food product compartment for combining with the silage to form the composite animal food,

and conveying and discharging means receiving the composite animal food and for conveying and discharging the same from the vehicle chassis.

4,428,538

GRINDING DISC FOR DISC REFINERS

Juan Valdivia, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,523

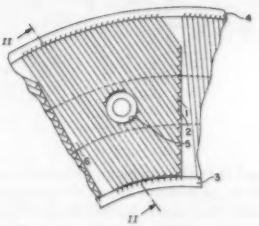
Int. Cl.³ B02C *7/12*

U.S. Cl. 241—298 **21 Claims**

1. A grinding disc for a disc refiner, the disc having a front grinding face and an opposite rear side; the disc being comprised of at least one pack, including a plurality of initially separate, weldable material, grinding strips, and the grinding strips extending across the front face of the disc; the disc is annular, wherein the grinding strips each have a radially outward and a radially inward end,

between adjacent grinding strips of the plurality, a respective intermediate strip being positioned; the intermediate strips being initially preformed, of weldable material and being of sufficient strength to rigidify the pack of grinding and intermediate strips;

at the rear side of the disc, the grinding strips and the intermediate strips are substantially planar;



measured from the rear side toward the front grinding face of the disc, the intermediate strips being shorter in height toward the front face of the disc than are the grinding strips;

an outward and an inward supporting ring for limiting the radially outward and radially inward ends, respectively, of the grinding strips; the grinding and intermediate strips both being welded to both supporting rings.

4,428,539

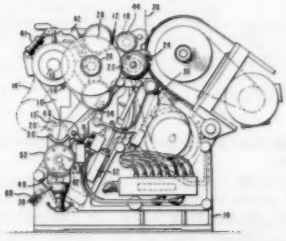
APPARATUS TO ASSIST DOFFING OF A YARN WINDUP

Joshua Benin, Newark; Kenneth L. Mulholland, Wilmington, both of Del., and John F. Reichenberg, Salisbury, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 277,141, Jun. 25, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 485,751

Int. Cl.³ B65H *54/06, 67/04*

U.S. Cl. 242—18 A **2 Claims**



1. In a yarn winding apparatus that includes a frame, a drive roll for winding yarn on a bobbin by driven engagement with the bobbin, a plurality of articulated swing arms each carrying a bobbin chuck for rotatably mounting a yarn bobbin, said arms in turn being mounted to said frame for movement between an operative position where the yarn bobbin rests on the drive roll to wind yarn on the bobbin and an inoperative position where the wound bobbin moves away from the drive roll to a doffing position, the improvement comprising: a drive wheel pivotally mounted to said frame and located at said doffing position to engage said bobbin chuck and rotate the wound bobbin at a predetermined speed; a shock absorber connected between said drive wheel and said frame for maintaining said drive wheel at said doffing position for engagement with said bobbin

chuck as said bobbin chuck is moved to said doffing position, whereby said drive wheel is yieldably mounted to said frame and said yieldable mounting prevents bouncing off of the bobbin chuck and drive wheel; and means selectively operable to rotate and stop said drive wheel.

4,428,540

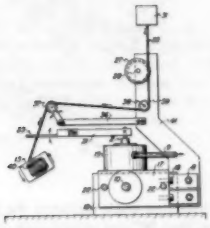
APPARATUS FOR MAINTAINING THE RELATIVE POSITION BETWEEN WIRE BEING FED ONTO A BOBBIN AND WIRE WOUND ABOUT THE BOBBIN FOR FORMING A COIL OF WIRE

Kenneth H. Calcagno, 1161 Westbrook Rd., West Milford, N.J. 07480, and William F. Calcagno, Jr., 22 Russell Rd., Ringwood, N.J. 07456

Continuation-in-part of Ser. No. 104,785, Dec. 18, 1979, abandoned. This application Apr. 21, 1982, Ser. No. 370,359

Int. Cl.³ B65H *54/04, 54/28*

U.S. Cl. 242—25 R **14 Claims**



1. An apparatus for maintaining a relative position between wire being fed onto a bobbin and wire wound about the bobbin for forming a coil, comprising wire supply means; guide means for guiding the wire onto the bobbin; a sensing arm being movably responsive to shifting of the wire upon winding of said wire onto the bobbin; displacing means for shifting said guide means dependent upon the movement of said sensing arm and therefore the position of the wire wound about the bobbin, whereby as the relative position of the wire being fed onto the bobbin and the wire wound about the bobbin changes, the sensing arm is shifted thereby actuating said displacing means and causing movement of said guide means, thereby reestablishing the relative position between the wire being fed onto the bobbin and the wire wound about the bobbin; said displacing means comprising in combination a hydraulically balanced hydro-mechanical servo-valve, a shaft connecting said valve to said sensing arm, and a hydraulic cylinder containing a piston, said cylinder being in operational communication with said servo-valve, guide means and sensing arm, whereby as said sensing arm shifts in response to said shifting wire, an error from null is generated in the hydraulically balanced hydro-mechanical servo-valve, causing said hydraulic cylinder to move in a direction so as to re-establish null and displacing said guide means to a new position, thereby re-establishing the relative position of the wire being fed onto the bobbin and the wire wound about the bobbin.

4,428,541

BOBBIN AND A BOBBIN SUPPORT STRUCTURE FOR A ROVING FRAME

Peter Novak, Tägerwilen, Switzerland, assignor to Rieter Machine Works, Limited, Winterthur, Switzerland

Continuation of Ser. No. 191,125, Sep. 26, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,563

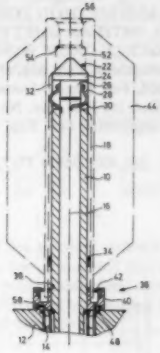
Int. Cl.³ B65H *54/54*

U.S. Cl. 242—46.2 **20 Claims**

1. A bobbin support structure for a roving frame comprising a spindle;

bobbin engaging means on said spindle for engaging an internal shoulder of a tubular bobbin to support the bobbin;

drive means on said spindle for inter-engaging with a corresponding drive means on the bobbin interior to transmit a rotary drive force from said spindle to the bobbin; and



means on said spindle and rotatable therewith for clamping a roving tail against an outwardly facing surface of a lower end of a received bobbin.

4,428,542

WIRE-DRIVING DEVICE FOR WINDOW REGULATOR

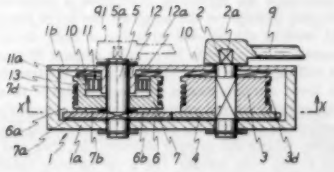
Tetuo Kobayashi, Ikeda, and Syoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System, Inc., Hyogo, Japan

Filed Jan. 20, 1982, Ser. No. 341,141

Claims priority, application Japan, Jul. 27, 1981, 56-118243; Aug. 8, 1981, 56-124439

Int. Cl.³ B66F *11/00;* **E05F** *11/48*

U.S. Cl. 242—54 R **10 Claims**



1. A wire-driving device for a window regulator comprising:

a casing;

a first shaft rotatably supported in said casing, said first shaft having a first pulley and a first gear mounted thereon;

a second shaft rotatably supported in said casing in parallel with said first shaft, said second shaft having a second gear and said second pulley mounted thereon; one of said second gear and said second pulley being fixedly mounted on said second shaft and the other being rotatably mounted and axially moveable on said second shaft, wherein said first gear and said second gear are meshed with each other, and wherein facing side surfaces of said second gear and second pulley each include a ratchet means for engaging each other when said second gear rotates in one direction relative to said second pulley and for not engaging each other when said second gear rotates in the opposite direction relative to said second pulley, and

a wire having one end secured to each of said first and second pulleys and being wound around each pulley, such

that said wire is unwound from said second pulley when said second pulley is rotated in a direction such that said ratchet means are not engaged.

4,428,543

APPARATUS AND METHOD FOR REPLACING A FINISHED ROLL WITH AN EMPTY ROLL CORE IN A DOUBLE-DRUM WINDER

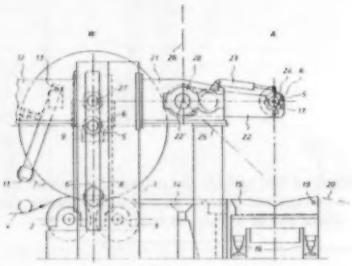
Friedrich Kuhn, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,303

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040398

Int. Cl.³ B65H *17/12*

U.S. Cl. 242—66 **15 Claims**



1. Apparatus for replacing a finished web roll with an empty core and a roll support in a drum-type web winder, wherein

the web winder comprises a winding station including drum means on which the web is wound on a roll support supported on a core; an extraction station removed from the winding station and including extraction means for extracting a core from a wound roll then at the extraction station; transfer means for transferring a wound roll from the winding station to the extraction station;

the apparatus for replacing comprises a support; a lever movably carried on the support; the lever having a free end with a gripper for gripping a core; lever moving means for moving the lever with respect to the support, the roll support at the drum means and the transfer means; the lever moving means moving the lever to move the gripper between the extraction station, where the gripper receives an empty core and roll support, and the winding station, where the gripper delivers the core and roll support to the web winder; the lever moving means raising the gripper to raise a core and a roll support supported on the core to pass over a finished roll which may be present at one of the winding station and the transfer means as the gripper moves that core and a supported roll support to the winding station and the support lever moving means and gripper being shaped so that the finished roll would be able to extend up to the upraised core and roll support.

4,428,544

RETAINER FOR OSCILLATOR SYSTEM

Richard R. Councilman, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 15, 1979, Ser. No. 84,719

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.21 R **9 Claims**

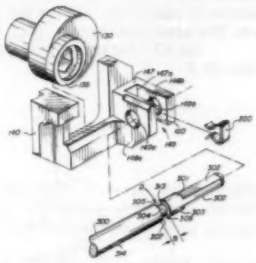
2. In a spinning reel having a housing with a front spool end and a back spool assembly end, a center shaft mounted in the housing with a drag end projecting into the housing, means within the housing for imparting reciprocating motion to the shaft including a reciprocating oscillator slide, an improved means for securing the shaft to the slide comprising:

(a) the shaft having a diameter "A" and an undercut groove near the drag end, the groove having sides and an undercut with a diameter "D" and a width dimension between the sides of "B",

(b) clevis secured to the side of the slide and projecting outwardly therefrom having two lugs, each lug having a hole slightly larger than "A", each lug having an inner surface and a space between the inner surfaces being slightly greater than "B",

(c) the shaft slip fit into each hole with the undercut diameter positioned in the space and the groove sides substantially aligned with the inner surfaces,

(d) a retainer clip having a resilient base and first and second inwardly directed resilient bifurcated legs integral with



the base, an included angle between the first leg and the base being less than 90° and an included angle between the second leg and the base being less than 90°, the base and legs forming a partially triangular shaped cross-sectional configuration, external clip surfaces common to the base and legs defining a clip width slightly less than the dimension "B", each leg having an open end with the ends being spaced apart a distance "F" which is less than the diameter "D", the clip mounted on the undercut diameter and located in the space between the lugs, the base and legs extending beyond the diameter "A" whereby the sides of the grooves bear against the external clip surfaces which in turn bear against the inner walls preventing relative sliding movement between the shaft and the slide.

4,428,545

SAFETY BELT SYSTEM HAVING RETRACTOR EQUIPPED WITH MANUAL LOCKING MECHANISM

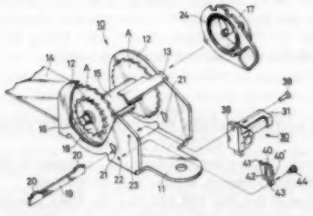
Katsumi Naitoh, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 252,070

Claims priority, application Japan, Apr. 16, 1980, 55-049814

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. A webbing retractor arrangement including a manual locking mechanism comprising:

retractor means biased in the webbing-retracting direction;

locking means which can be placed in engaging and non-

engaging positions for permitting said retractor means to be prevented from rotating in the webbing-withdrawal direction and to rotate in the webbing withdrawal direction;

mechanically operable operating means for manually operating said locking means so as to bring it to either one of said positions, said operating means including a wire by which said locking means is brought to either one of said positions;

means for limiting the amount of movement of said wire to a given value or less;

said means for limiting the amount of movement comprising an arm to which one end of said wire is attached, a manually operable lever which is integrated with a cam engageable with said arm, said cam having an arc portion and a chord portion, said arm being normally engaged with the chord of the cam and, when operated, being engaged with the arc portion of the cam, whereby said wire is not further moved even when said lever is thereafter rotated; and

buffer means interposed between said locking means and said operating means.

4,428,546

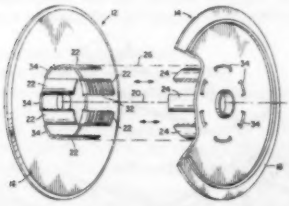
ADJUSTABLE SPOOL ASSEMBLY

Allen T. Weideman, North Hollywood, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 21, 1981, Ser. No. 332,717

Int. Cl.³ B65H *75/14*

U.S. Cl. 242—118.5 **26 Claims**



1. An adjustable spool assembly, comprising:

a drum portion defining a central axis and including a plurality of axially extending members circumferentially spaced about said axis, plural of such members having engagement elements projecting therefrom transversely to such axis; and

a pair of end flanges spaced from each other along said axis by said drum portion, each of said flanges including a plurality of openings disposed circumferentially commonly with said members about said axis and interposed therebetween for receiving said members therein, said openings being sized such that a surface portion of said end flange adjacent such openings engages said engagement elements, such end flange surface portions comprising a cantilevered resilient portion.

4,428,547

MAGNETIC RECORDING TAPE CARTRIDGE

Shinichi Gotoh, Kyoto, Japan, assignor to Hitachi Maxell, Limited, Osaka, Japan

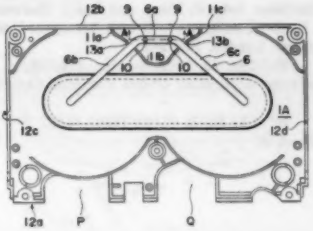
Filed Mar. 11, 1982, Ser. No. 357,082

Claims priority, application Japan, Mar. 11, 1981, 56-32704[U]; Jan. 16, 1982, 57-4255[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **6 Claims**

1. A magnetic recording tape cartridge comprising a top section and a bottom section, each of the sections having a front wall, a rear wall and side walls, said sections being assembled together to define a tape chamber therebetween for containing a pair of tape reels each of which is rotatably supported with a bottom axis thereof engaged with said bottom section and a top axis thereof engaged with a spring plate member, said spring plate member having a base portion fixed onto said top



section and a pair of leg portions extending from said base portion to each of the top axis of said tape reels,

wherein the improvement comprising a partition wall means for separating at least said base portion of said spring plate member from said tape chamber.

4,428,548

MAGNETIC RECORDING TAPE CARTRIDGE

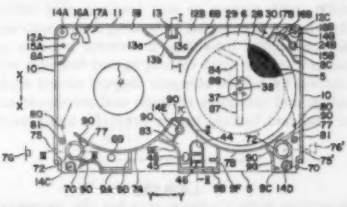
Shinichi Gotoh, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,801

Claims priority, application Japan, Jul. 28, 1980, 55-105610[U]

Int. Cl.³ G03B *1/04*; G11B *15/13*

U.S. Cl. 242—199 **4 Claims**



3. A magnetic recording tape cartridge comprising:

(a) a bottom section and a top section assembled together by a plurality of tapping screws so as to provide a cartridge case having a front wall, top plate, bottom plate and a tape chamber with a plurality of openings formed in said front wall,

(b) a pair of tape reels juxtaposed in said tape chamber for receiving a magnetic recording tape to be wound around said tape reels, each of the tape reels rotatably mounted relative to a drive shaft insertion hole defined in said bottom plate of said bottom section of said cartridge case,

(c) a column-like boss member projected from the central portion of one of said plates of said top section or bottom section, said boss member having a screw insertion hole for threadedly receiving one of said tapping screws, and

(d) a partition wall member projected from one of said plates in a space between said column-like boss member and the peripheral edges of said pair of reels to provide a chamber for enclosing scraps produced from said column-like boss member during insertion of said tapping screw into the hole of said column-like boss member so as to prevent the scraps from damaging said magnetic recording tape wound around said tape reels, said partition wall member being provided with at least one auxiliary rib projected

from one of said plates with one end connected with the column-like boss member.

4,428,549

ARRANGEMENTS FOR MOUNTING A PROBE ON AN AIRCRAFT

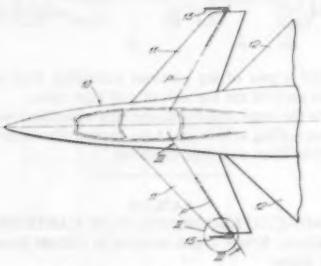
David P. Halliday; John F. Riley, and Barry Sharrock, all of Preston, England, assignors to British Aerospace Public Limited Company, London, England

Filed Oct. 23, 1981, Ser. No. 314,416

Claims priority, application United Kingdom, Oct. 24, 1980, 8034415

Int. Cl.³ B64D *47/00*; B64C *39/12*

U.S. Cl. 244—1 R **7 Claims**



1. An aircraft having a fuselage portion, a main wing portion, an aerodynamic control surface projecting transversely from the fuselage at a location generally forwardly of the main wing portion and a probe carried adjacent the outboard end of the aerodynamic control surface in a predetermined, fixed orientation, with respect to said fuselage, said aerodynamic control surface being carried by bearing means associated with the fuselage portion for tilting movement about a generally spanwise pivotal axis with respect to said fuselage, said probe being carried by a fixed elongate support means anchored to the fuselage and extending through said aerodynamic control member and said bearing means generally along said pivotal axis.

4,428,550

VIBRATION-INSULATING STABILITY IMPROVING TORQUE FORCE DEVICE

Hugh G. Evans, W. 214 6th Ave.; Stephen Speer, S. 358 Couer d'Alene, Apt. #6, and James S. Christy, E. 10918 26th, all of Spokane, Wash. 99204

Continuation-in-part of Ser. No. 282,057, Jul. 10, 1981, abandoned. This application Oct. 21, 1981, Ser. No. 313,470

Int. Cl.³ B64C *17/04*

U.S. Cl. 244—93 **18 Claims**

1. In a conventional aircraft comprising wing surfaces mounted on a fuselage, a tail having a separate vertical rudder and horizontal stabilizer surfaces, with elevators pivotally mounted on the trailing edges of the horizontal stabilizers; and a control system for manually pivoting the elevators, the control system comprising a manually controlled, laterally extending, rotating control member and direct motion-transmitting means comprising relatively rigid, vibration-carrying members, between the rotating member and the elevators, designed to pivotally move the elevators in response to rotation of the rotating control member, the improvement which comprises a constant mass torque member fixedly connected to the rotating member such that the torque member is at a substantially constant radial distance from the axis of rotation of the rotating member, the center of gravity of the torque member being at least about two inches radially distant from the axis of the rotating control member, along a radial line defining the effective torque arm, and a resilient vibration insulating connecting joint between the torque member and the rotating member being located relatively radially inwardly towards the axis of the rotating member from the center of gravity of the torque member, whereby the fundamental natural frequency of the torque member and the rotating member is less than the fundamental natural frequency of the horizontal stabilizer and greater than the pitch stability oscillation frequency.

4,428,551

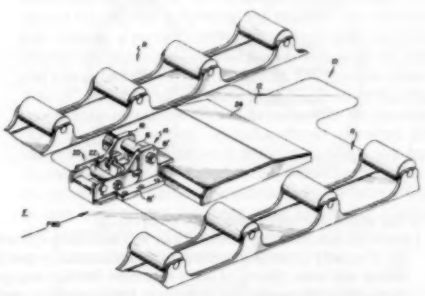
TOW PLATE FOR AERIAL CARGO DELIVERY

Bryon L. Woram, Stevensville, Canada, and James M. Hall, Mary Esther, Fla., assignors to Metric Systems Corporation, Fort Walton Beach, Fla.

Filed Feb. 4, 1982, Ser. No. 345,679

Int. Cl.³ B64D *1/02, 17/38*

U.S. Cl. 244—137 R **11 Claims**



1. A tow plate assembly especially for use in an aerial cargo delivery system wherein a load is extracted from a moving aircraft by at least one extraction parachute, comprising a tow plate base, an extraction clevis member adapted to be connected to a load extraction parachute, means for mounting the extraction clevis to the tow plate base for guided longitudinal movement, first releasable means for retaining the extraction clevis to the tow plate base in a retention position, said first releasable means including a ball locking mechanism, a drogue jettison clevis member adapted to be connected to a drogue parachute, means mounting the drogue jettison clevis for arcuate movement about a pivot means on the extraction clevis, second releasable means for retaining the drogue jettison clevis to the extraction clevis in a retention position, means located remotely from said clevis members for selectively and independently operating said first and second releasable means, said second releasable means comprising a locking finger on said drogue jettison clevis, locking shaft means slidably retained on the extraction clevis and engageable with said locking finger for releasably retaining the drogue jettison clevis to the extraction clevis, anti-friction bearing means arranged between said locking shaft and the extraction clevis for reducing the sliding friction therebetween, said second releasable means further comprising a pair of elongated slots arranged in said extraction

clevis for slidably receiving said locking shaft, release bar means bearing upon said locking shaft for holding said shaft in position engaging the locking finger of the drogue jettison clevis, a shear wire for locking the release bar means in position and release lever means connected to said remote operating means and engageable with said locking shaft for sliding the same along said slots to thereby sever the shear wire and disengage the locking finger of the drogue jettison clevis.

4,428,552

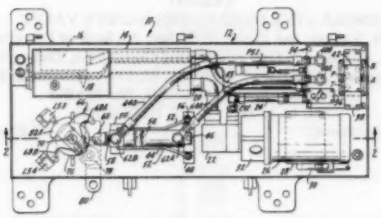
RAILROAD SWITCH MACHINE

Earl E. Frank, Tallman, N.Y., and Bing S. Yee, Paramus, N.J., assignors to Abex Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,110

Int. Cl.³ B61L *7/04, 5/04;* **F15B** *11/10*

U.S. Cl. 246—393 **5 Claims**



5. A high-speed railroad switch machine for throwing switch points between first and second limit positions, comprising:

a uni-directional electric motor;

a hydraulic pump driven by the motor;

a hydraulic cylinder including a piston operatively connected to the switch points;

a four-way, two-position hydraulic control valve adapted to supply hydraulic fluid to the cylinder such that the piston is alternately driven in extending and retracting directions by fluid from the pump;

electrical control circuitry for governing operation of the motor; and

means for positioning the hydraulic control valve so as to cause the cylinder to throw the switch points to a desired limit position, said means repositioning the hydraulic control valve after an extension and retraction such that the hydraulic control valve supplies fluid for an extension sequence immediately upon a subsequent start-up of the pump.

4,428,553

ADJUSTMENT MECHANISM

Joseph Pallant, Wolverhampton, England, assignor to H. R. Turner (Willenhall) Limited, West Midlands, England

Continuation of Ser. No. 186,969, Sep. 15, 1980, abandoned. This application Dec. 3, 1982, Ser. No. 446,568

Claims priority, application United Kingdom, Sep. 29, 1979, 7933843; Jan. 31, 1980, 8003341

Int. Cl.³ F16M *11/00*

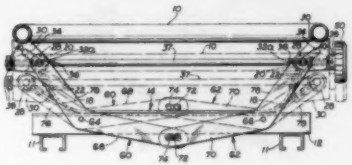
U.S. Cl. 248—157 **2 Claims**

1. A vertically adjustable seat structure comprising a rigid seat frame, a rigid support frame, and means for mounting the seat frame on the support frame which prevents the seat from bouncing up and down and which provides vertical adjustment of the seat frame relative to the support frame, said means including

(a) a resiliently flexible element having two end portions which are oppositely inclined relative to one another, said element being fixed to one of said frames, and the ends of said inclined portions being supportingly connected to the other of said frames,

(b) a strut which rigidly connects the ends of said inclined portions to space said ends a fixed distance apart, and

(c) means for adjusting the effective length of said strut, thus varying the inclination of said portions by flexing said portions and thereby adjusting the seat frame vertically relative to the support frame,



(d) said portions being connected also by a linkage which transmits bending deflection of each portion to the other portion to cause them to bend oppositely to one another in unison.

4,428,554

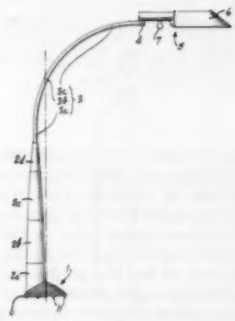
FREE-STANDING SUPPORT FOR A LAMP OR THE LIKE

Cedric Hartman, P.O. Box 3842, Omaha, Nebr. 68103

Filed Mar. 10, 1981, Ser. No. 242,331

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—415 **14 Claims**



12. A support for an article, comprising:

a. free-standing base including an annulus (**10**) having a central vertical axis and adapted for support on an underlying surface and a disk (**12**) rotatable within the annulus about said axis;

b. a column (**2**) fixedly mounted in a vertical position on the disk and having a vertical axis spaced from the vertical axis of the disk;

c. an arm (**3***b*,**3***c*) extending from the column above the base to a locality spaced from the axis of the annulus on the opposite side thereof from the axis of the column;

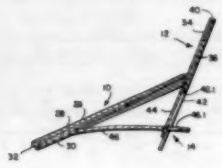
d. an article (**5**,**6**) supported on the arm at said locality, the torque about the center of the base due to the mass of the article and the arm being balanced by the torque about said center due to the mass of the column, so that the article and support are stable against tilting in any direction.

4,428,555

EASEL-TYPE MOUNT

Douglas C. Atkins, Middleboro, Mass., assignor to Winthrop-Atkins Co., Inc., Middleboro, Mass.

Filed Mar. 22, 1982, Ser. No. 360,666
Int. Cl.³ A47B 97/04
U.S. Cl. 248—459 **12 Claims**



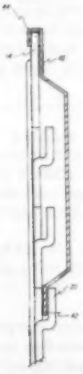
1. An easel comprising coextensive rectangular front and back panels of two-ply construction bound along at least two parallel edges, said panels being foldable transversely further from one end than the other to form a support and headboard along one edge thereof and leg and brace members cut out of the panels elastically interengageable to hold the support and headboard at an obtuse angle relative to each other, characterized in that said leg comprising both plies of the back panel and the back ply of the front panel such that the front ply of the front panel is imperforate and said brace comprises both plies of the back panel.

4,428,556

UNIVERSAL CONCRETE SCREED SYSTEM

Albert Parsons, and H. Norris Havens, both of Columbia, S.C., assignors to Consolidated Systems, Inc., Columbia, S.C.

Filed May 10, 1982, Ser. No. 376,608
Int. Cl.³ B29C 7/00
U.S. Cl. 249—3 **3 Claims**



1. A screed stake for selectively supporting one of four elongated screeds, each differing in their vertical dimension, for forming a joint between immediately adjacent concrete slabs comprising:

a vertically extending stake generally pointed on the lower end and having a reinforcing channel along the longitudinal axis thereof from the lower end thereof to a point adjacent but short of the upper end thereof to leave a generally planar upper end,

said stake having three sets of two ear-like members at each of three different distances from the upper end thereof, each of said ear-like members extending laterally from and then upwardly alongside said stake and being adapted to receive the lower end of one of said four screeds of different vertical dimensions,

one of each of said set of ear-like members being located on opposite lateral sides of said reinforcing channel and both of each of said set of ear-like members extending upwardly alongside said stake on the same side thereof as said reinforcing channel

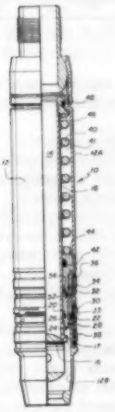
whereby all four of said vertical dimensions of screed may be supported by said three sets of members in a vertical space insufficient to reasonably accommodate four sets of members, three of said four vertical dimensions of screed being supported by said upper end and said three sets of members respectively, and the fourth of said four vertical dimensions of screed being supported by the uppermost one of said sets of members and by contact with the stake between said upper end and said reinforcing channel.

4,428,557

SINGLE LINE DEEP DEPTH SAFETY VALVE

John H. Yonker, and Ernest P. Fisher, Jr., both of Carrollton, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 75,239, Sep. 13, 1979, abandoned. This application Jan. 29, 1982, Ser. No. 343,849
Int. Cl.³ F16K 31/122; E21B 33/00
U.S. Cl. 251—62 **4 Claims**



1. A subsurface safety valve comprising,

an elongate rigid tubular housing, at least two spaced annular seals on the exterior of and adjacent one end of said housing,

a port in the housing between said seals for receiving control pressure fluid,

a valve seat and cooperable valve member controlling flow through said housing,

a tubular actuator in the housing controlling movement of said valve member between said open and closed positions,

an annular piston disposed on said actuator,

said piston having outer diameter sections of different diameter,

spaced sliding seal means between said housing and a respective one of said different diameter sections of said piston to provide a pressure responsive member,

said sliding seal means in open and closed positions of said valve member positioned approximately within the area defined by said spaced annular seals,

and spring means positioned within the housing and spaced longitudinally from the area between said pair of annular seals,

the interior and exterior portions of the housing containing said spring means exposed to the same pressure fluid,

fluid pressure through said port acting on said piston to actuate said valve.

4,428,558

PROPORTIONAL SOLENOID

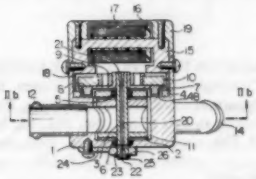
Takaharu Odogaki, Okazaki; Hisasi Kawai; Takeshi Matsui, both of Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 13, 1981, Ser. No. 234,264

Claims priority, application Japan, Feb. 15, 1980, 55-17976

Int. Cl.³ F16K *31/08;* H02K *33/02*

U.S. Cl. 251—65 **6 Claims**



1. A proportional solenoid valve apparatus comprising,

a housing having an inlet and an outlet,

a rotary hollow shaft rotatably held by said housing,

a rotary valve disposed in said housing and fixed to said rotary hollow shaft,

a stationary coil element for generating a magnetic field in response to a current supplied thereto,

a rotary magnet fixed to one end of said rotary hollow shaft and being responsive to said magnetic field for creating a rotating force in proportion to the strength of said magnetic field within a rotation angle of 180 degrees, and

spring means made of a torsion bar for controlling the rotation of said rotary magnetic by a restoring force, said torsion bar extending through said rotary hollow shaft and one end of said torsion bar being fixed to said one end of said torsion bar being fixed to said one end of said rotary hollow shaft and the other end of said torsion bar being fixedly secured to said housing,

a rotation angle of said rotary hollow shaft being established by the balance of the rotating force of said rotary magnet and the restoring force of said spring means.

4,428,559

DIRECT DRIVE TYPE SERVO VALVE

Ken Ichiryu, Mito; Haruo Watanabe, Hitachi; Ichiro Nakamura, Katsuta, and Yoshimichi Akasaka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

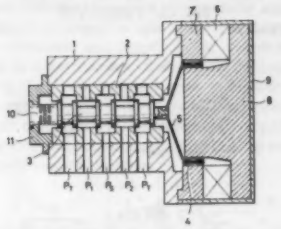
Filed May 28, 1981, Ser. No. 267,914

Claims priority, application Japan, Jun. 4, 1980, 55-74345

Int. Cl.³ F15B *13/044;* F16K *31/04*

U.S. Cl. 251—129 **12 Claims**

1. A direct drive type servo valve in which a spool in a sleeve is directly driven by the operation of a coil bobbin which constitutes a portion of the movable part of a force motor, while the force of the force motor is balanced by the reactional force generated by a resilient member to stabilize the position of said spool to control the flow of working fluid, characterized in that, said resilient member is constituted by a metallic cylindrical member having holes formed in the outer peripheral surface thereof, said holes being arranged to permit said metallic cylindrical member to generate an axial reactional force when pressed in the axial direction, that said resilient member is formed in one body with said spool from the same



material so as to be correctly coaxial with each other, and that said coil bobbin is fixed to said spool coaxially with the latter.

4,428,560

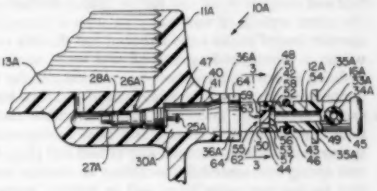
OUTLET COUPLING MEMBER FOR A PROPELLANT STORAGE CONSTRUCTION AND METHOD OF MAKING THE SAME

Joseph J. Erdelsky, Jeannette, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 2, 1981, Ser. No. 326,529

Int. Cl.³ F16L *37/28*

U.S. Cl. 251—149.1 **8 Claims**



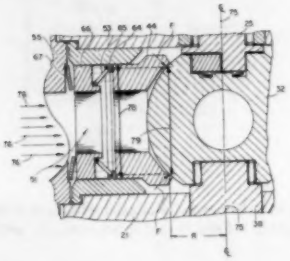
1. In the combination of a propellant storage construction and an outlet coupling member detachably interconnected to an outlet means of said construction for dispensing propellant from said construction, said outlet means comprising a locking surface means and an outlet passage in said construction and having a valve unit therein that requires a plunger thereof to be axially moved inwardly in said unit to open said unit so that propellant can be dispensed through said outlet passage to said outlet coupling member when said outlet coupling member is disposed in said outlet passage and engages and holds said plunger in its inward position while having interlocking means thereof interlocked with said locking surface means, the improvement wherein said outlet passage has a substantially cylindrical section and a frusto-conical mouth-like section intermediate said cylindrical section and said locking surface means, said outlet coupling member having a substantially flat end surface means spanning said outlet passage and engaging said plunger, said end surface means having opening means therein disposed outboard of said plunger for receiving said propellant that passes through said open valve unit, said outlet coupling member having a substantially cylindrical body portion provided with opposed ends and an annular groove intermediate said opposed ends thereof, one of said opposed ends of said body portion defining said end surface means, said body portion carrying an annular sealing ring in said annular groove, said sealing ring sealing with said outlet passage outboard of said valve unit.

4,428,561

BALL VALVE HAVING IMPROVED SEAL MEANS

William E. Thompson, R.R. 1, Box 89, Middletown, Ind. 47356

Filed Nov. 2, 1981, Ser. No. 317,579
Int. Cl.³ F16K *35/00*
U.S. Cl. 251—174 **10 Claims**



1. A ball valve operable between a full-open position and a closed position for regulating fluid flow, said ball valve comprising:

a valve body having a flow passageway extending therethrough and arranged to define a first inner surface and a second inner surface;

a ball plug member disposed within said flow passageway between said first and second inner surfaces and having a flow hole therethrough, said flow hole terminating in open ends adjacent the exterior surface of said ball plug;

a pair of oppositely positioned ball seats, each seat having a first end cooperatively disposed in sealing contact against the outer surface of said ball plug with a corresponding circular line of contact and a second end slidably received within a corresponding one of said inner surfaces and defining a corner intersection, each of said circular lines of contact encompassing the open ends of said flow hole; and

a pair of spring seal assemblies disposed within said valve body and positioned around said flow passageway, one spring seal assembly on each side of said ball plug, each of said spring seal assemblies including an annular seal portion having two outer faces and an interior corner with one face disposed contiguous to its corresponding ball seat and the other face disposed contiguous to the corresponding inner surface of the corresponding corner intersection and positioning means disposed against said interior corner and adapted to impart two lines of contacting force to said annular seal portion, one of said lines of force being directed toward said corresponding inner surface and the other line of force being directed toward said corresponding ball seat.

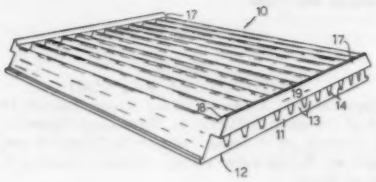
4,428,562

STOCK GRID

Frederick J. Carter, M.S. 1436, Cumners Rd., Toowoomba, Queensland, Australia

Filed Aug. 4, 1982, Ser. No. 405,258
Claims priority, application Australia, Aug. 7, 1981, PF0114
Int. Cl.³ A01K *3/00*
U.S. Cl. 256—17 **19 Claims**

1. A monolithic stock grid including a substantially planar base portion and a plurality of parallel rib members upstanding therefrom, each said rib member defining with an adjacent said rib member open-ended trough means extending across said base portion and wherein said base portion is adapted to be supported in use in a substantially horizontal attitude such that the upper portions of said rib members are disposed in a substantially horizontal plane, the number of said rib members being such, and said rib members being so sized and spaced from one another as to provide a support area for vehicles but to prevent or deter stock passage thereacross and wherein there is provided elongated reinforcing means extending transversely of said rib members and disposed at least at one side of



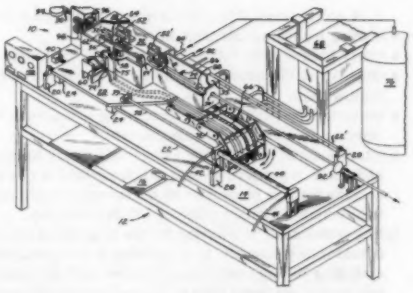
said grid, said reinforcing means being formed integrally with said rib members and interconnecting said rib members at least at or adjacent the upper portions thereof.

4,428,563

APPARATUS FOR SPOT ANNEALING TUBING

James L. Cunningham, and John M. Tatum, both of Decatur, Ala., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 357,781, May 6, 1982, abandoned. This application Jan. 26, 1983, Ser. No. 460,971
Int. Cl.³ C21D *9/573*
U.S. Cl. 266—113 **18 Claims**



1. An apparatus for selectively annealing a portion of a length of metallic tubing or the like while the tubing is moving comprising a base including ways; a carriage mounted for reciprocatory movement on the ways; an elongated annealing chamber mounted on the carriage; a pair of spaced clamps mounted in the upstream end of the annealing chamber, said clamps being spaced from each other by a distance which is at least as large as the axial length of a tube portion to be annealed; means to periodically actuate said spaced clamps to engage at least one discrete portion of a tube passing through said chamber and to cause said carriage and annealing chamber to be moved by the movement of said tube; means situated in said elongated annealing chamber for heating and annealing said at least one discrete portion of tube while it is engaged by said clamps; means to release said clamps; and means to return said carriage to the upstream end of the ways.

4,428,564

METALLURGICAL VESSEL

Rashed N. Nagati, Mars, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1982, Ser. No. 342,895
Int. Cl.³ C21C *5/50*
U.S. Cl. 266—246 **5 Claims**

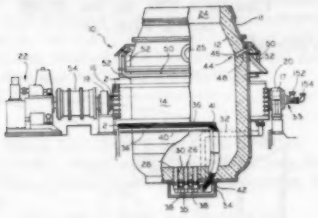
1. A metallurgical vessel having bottom tuyeres for delivering fluids beneath the level of molten metal within the vessel

and trunnion pins for tilting the vessel about a generally horizontal axis,

at least one of said trunnion pins having a hollow bore,

body means disposed within said bore,

a first plurality of passages formed generally axially of said body means and a second plurality of passages formed in said body means and extending laterally of said first passages, each passage of said second plurality intersecting a different one of the axial passages of said first plurality,



an adapter assembly for coupling a pipe to each passage of said second plurality of passages so that each of said passages can be coupled to an individual tuyere,

said adapter assembly including a plurality of adapter members, each adapter member having a head portion sealingly engaging said body means in communication with a different one of the passages of said second plurality of passages,

retainer means for securing each of said adapters in communication with its respective second passage,

and means for coupling a pipe to each of said adapters.

4,428,565

ARRANGEMENT FOR RESILIENT ABSORPTION OF FORCES

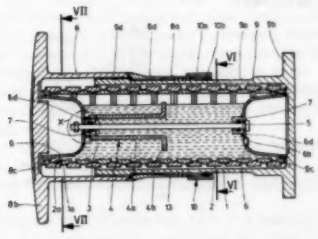
Christian Stiefel, Aachen; Josef Friedrichs, Krefeld-Verberg; Gino Marsella, Neuss, and Horst Kahle, Krefeld, all of Fed. Rep. of Germany, assignors to Ringfeder GmbH, Krefeld, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,356

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020026

Int. Cl.³ F16F *3/06*

U.S. Cl. 267—9 A **24 Claims**



1. An arrangement for resiliently absorbing forces in various operational conditions, particularly for buffers, comprising an elongated housing having an axis; a resilient element located in said housing and formed as a friction spring having a plurality of inner conical rings with a predetermined inner diameter and a plurality of outer conical rings cooperating with one another with with interposition of a lubricant, said inner and outer rings bounding an inner chamber; and an additional body of the lubricant accommodated in said inner chamber bounded by said inner and outer rings and including such a quantity of the lubricant which is sufficient for continuously replenishing the lubricant between said inner conical rings and said outer conical ring during operation of the arrangement in various operational conditions; and means for distributing the lubricant during impact delivered upon the arrangement and including an insert element arranged in said inner chamber inside said body of the lubricant, said insert of said distributing means being formed as a bar member of elastically deformable material and having an outer surface with a diameter which is smaller than the inner diameter of said inner conical rings so that said inner chamber is formed and said body of the lubricant is accommodated between said inner conical rings and the outer surface of said bar member.

4,428,566

TWO-TUBE HYDROPNEUMATIC SHOCK ABSORBER

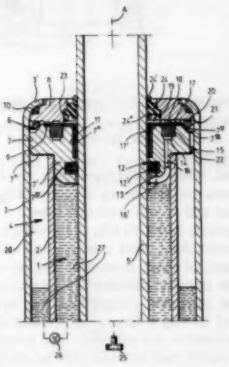
Johannes J. de Baan, and Adolf Adrian, both of Ennepetal, Fed. Rep. of Germany, assignors to August Bilstein GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 323,890

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044460

Int. Cl.³ F16F *9/36*; B60G *15/00*

U.S. Cl. 267—64.15 **10 Claims**



1. A hydropneumatic shock absorber comprising:

an outer tube centered on an upright axis;

an inner tube coaxially spaced inside said outer tube and forming therewith an outer gas/liquid chamber;

a piston rod inside said inner tube, generally coaxial with said tubes, and forming with said inner tube and inner liquid chamber;

a piston carried on said rod and radially outwardly engaging said inner tube, whereby axial displacement of said piston and rod relative to said tubes in one direction pressurizes said inner chamber;

a foot valve between said inner and outer chambers and permitting limited liquid flow therebetween;

a body of liquid filling said inner chamber and partially filling said outer chamber;

an annular plug fixed at the upper axial ends of said tubes and generally axially upwardly closing said inner and outer chambers;

a guide bushing in said plug and surrounding said piston rod;

an annular outer seal in said plug surrounding said piston rod above said bushing and forming with said bushing and plug an annular compartment surrounding said rod, said plug being formed with an inner passage having one end opening into said compartment and another end opening into said inner chamber and with an outer passage having one end opening into said compartment and another end opening into said outer chamber;

a porous body in said inner passage;

a check valve in said outer passage permitting flow only from said compartment into said outer chamber; and

an annular inner seal in said plug and surrounding said piston rod immediately below said bushing.

4,428,567

COMBINED SHOCK ABSORBENT AND SUSPENSION FOR VEHICLE

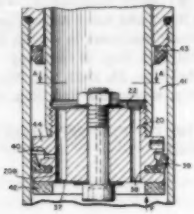
Jean P. Fournales, Toulouse, France, assignor to Fournales France, Castanet Tolosan, France

Filed Dec. 30, 1980, Ser. No. 221,273

Claims priority, application France, Jan. 4, 1980, 80 00345

Int. Cl.³ F16F *9/348, 9/36*

U.S. Cl. 267—64.26 **14 Claims**



1. A combination shock absorber and suspension device for a vehicle comprising:

(a) a first, exterior tube having a closed lower end and an open upper end;

(b) a second, interior tube having a closed upper end and an open lower end and being telescopically positioned within the upper end of said exterior tube;

(c) a first piston being rigidly connected to the lower end of said interior tube, said interior and exterior tubes being axially spaced apart from one another and thereby forming a first, annular chamber for retaining pressurized fluid, said first chamber comprising the space between said tubes and having a lower end bounded by said piston, a second chamber for retaining said pressurized fluid being located within said exterior tube below said piston, a third chamber for retaining said pressurized fluid being located within said interior tube and adjacent to said lower end of said interior tube, and above said piston, said piston comprising a central axial bore providing a permanent fluidic connection between said second and said third chambers, said piston further comprising at least one first flap valve orifice for conducting fluid from said second chamber to said third chamber during compression of said shock absorber and at least one second flap valve orifice for conducting fluid from said third chamber to said second chamber during extension of said shock absorber, wherein fluid is adapted to be retained within said chambers and to be communicated between said chambers during relative displacement of said interior tube and said exterior tube, and wherein fluid is adapted to reside between said piston and said exterior tube;

(d) a closing ring attached to the upper end of said exterior tube, said interior tube and said piston being slidably retained within an opening in said ring, said ring being adapted to guide longitudinal movement of said piston and said interior tube and said piston thereby being movable within said exterior tube so as to change the relative size of said second and third chambers, said piston and said inner surface of said exterior tube being spaced apart from one another in non-abutting relationship and said ring and said interior tube defining the upper end of said first chamber; and

(e) a flexible lip adapted to contact said exterior tube and which is adapted to permit fluid to be conducted along the periphery of said piston and from said second chamber into said first chamber during compression of said shock absorber, and wherein said piston has at least one radial orifice positioned above said lip and which is adapted to permit fluidic communication between said first chamber and said third chamber via said second flap valve orifice.

4,428,568

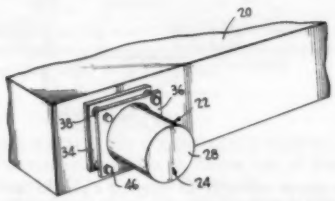
FORCE-ABSORBING DEVICE

Robert B. McNatt, Relay, and John T. Day, Winfield, both of Md., assignors to Rubber Millers, Inc., Baltimore, Md.

Filed Jul. 8, 1981, Ser. No. 281,388

Int. Cl.³ F16F *1/36*

U.S. Cl. 267—140 **21 Claims**



1. A force-absorbing member formed of a resilient, deformable, low modulus material having at one end thereof a restraining flange on at least two opposite sides thereof, and restraining means engaging said flange for restraining said flange while permitting resilient deformation of said force-absorbing member to one side of its axis, and said restraining flange being of a size sufficient and of a material having tensile strength sufficient to prevent both the movement of said flange through said restraining means and rupture of said flange during said resilient deformation of said force-absorbing member, said restraining means being in the form of a fixed member engaging said flange with said flange being solidly positioned against a high modulus material.

4,428,569

ENGINE MOUNTING FOR AUTOMOBILE

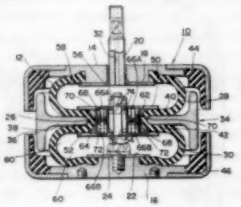
Hirofumi Takei, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 29, 1981, Ser. No. 278,400

Claims priority, application Japan, Jul. 22, 1980, 55-100170

Int. Cl.³ F16M *1/00, 13/00*

U.S. Cl. 267—140.1 **6 Claims**



1. An engine mounting for suspending an engine relative to a vehicle structure, comprising:

a first armature for connection to the engine and a second armature for connection to the vehicle structure;

an elastic bellows interposed between said first and second armatures and defining therewith a closed enclosure;

an inertia mass mounted on said bellows to be movable with a part of said bellows and resiliently held between said first and second armatures to vibrate independently of said first and second armatures;

said closed enclosure being filled with pressurized gas;

a partition wall disposed within said closed enclosure and fixedly attached to said inertia mass for unitary motion therewith, said partition wall dividing the interior of said closed enclosure into a first chamber and a second chamber and defining passage means for allowing flow communication between said first chamber and said second chamber; and

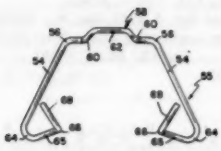
effective area varying means for varying the effective area of said passage means in response to a difference between pressure in said first chamber and that in said second chamber, said effective area varying means decreasing the effective area of said passage means during oscillation of said bellows with amplitudes larger than a predetermined amplitude and for increasing the effective area of said passage means during oscillation of said bellows with amplitudes smaller than said predetermined amplitude.

4,428,570

TOOL-LOADABLE BIASING SPRING

William R. Foshee, Indianapolis, and Kevin L. Carey, Pendleton, both of Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Dec. 2, 1981, Ser. No. 326,483
Int. Cl.³ F16F 1/18; E05B 3/04
U.S. Cl. 267—164 **16 Claims**



1. Spring-biased mechanism for securing a knob or the like with respect to a knob sleeve adapted to be assembled by translatory movement of a biasing spring, comprising

a tubular member,

a plate mounted for movement transversely of the tubular member and adapted to be biased in a forward direction of such movement,

said plate having border portions adjacent an opening in the plate, exposed axially within the tubular member, and including a forward thrust-receiving border,

a generally U-shaped spring having a bight engaged in thrust-transmitting relation with said forward border and side legs extending unrestrained chordally across the tubular member and having cam nose portions engaged in camming relation with forwardly diverging inner surfaces at the opposite side of the tubular member, the legs when in operative position being stressed to exert camming force laterally against such diverging surfaces and thereby to produce forward biasing force at the bight of the spring,

wherein the improvement comprises the following additional features and relationships:

said plate border portions including side and rearward borders,

said spring being resiliently bendable to a loading condition wherein it is movable by translatory movement normal to its plane into assembly relation with the plate,

said spring bight including an offset and the plate and spring being so shaped that by translatory movement of the spring in loading condition such bight offset will pass through the plate opening to a position extending through the plane of the plate and from which it is then movable into interlocked relation with the plate by forward movement of the spring parallel to the plate,

said spring legs having inward reverse bends forming said cam nose portions for engagement with said diverging surfaces, having leg offsets inward of such bends to extend through the plane of the plate, and having retaining fingers bent outward from said leg offsets to engage behind the plate,

the plate and spring being so shaped that, with the spring in loading condition, the same translatory movement which passes the bight offset through the plate opening will carry the leg offsets and outward bent retaining fingers of the spring through the plane of the plate to assembly relation with the plate, where they will be movable into interlocked relation with side borders of the plate,

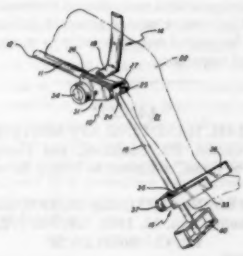
the spring, on release from its loading condition, being operative to move its legs outward from each other to carry said cam nose portions into camming engagement with said diverging surfaces of the tubular member and thereby to cam the spring forward in its plane so as to carry the bight offset into thrust-transmitting relation with the plate and interlock the retaining fingers with side borders of the plate.

4,428,571

LIMB POSITIONING DEVICE

Edward D. Sugarman, 6726 Gleason Pl., Fayetteville, N.Y. 13066

Filed May 15, 1981, Ser. No. 264,081
Int. Cl.³ A61G 13/00
U.S. Cl. 269—328 **2 Claims**



1. A leg positioning device for use with an operating table having a fitting for the attachment of accessories, a central support member, a rod fixed to the support member and extending outwardly therefrom for engagement with the fitting, a first, generally L-shaped limb engaging member the horizontal leg of which is pivotally connected to the support member for pivotal movement relative thereto, the vertical leg of the limb engaging member operating as a fulcrum that is engageable with the leg on one side or the other of the knee, an extension member in the form of an elongated rod movably connected at one end to the support member, the rod being connected to the support member by a ball joint to permit angular adjustment of the rod with respect to the support member, means on the support member to releasably hold the extension member rod in the position of desired adjustment, and a second limb engaging member adjustably mounted on the extension member rod, the second limb engaging member being movable into any one of a plurality of predetermined positions along the rod and being adapted to engage the lower extremity of the leg in the area of the ankle.

4,428,572

COMBINED SHEET INVERTER AND SORTER

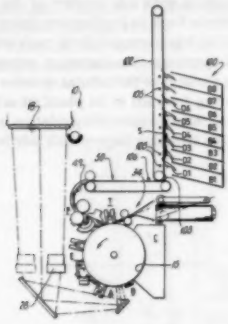
Anthony E. Burke, Radlett, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 14, 1981, Ser. No. 301,996

Claims priority, application United Kingdom, Sep. 25, 1980, 8030937

Int. Cl.³ B65H *29/32, 31/24, 29/54*

U.S. Cl. 271—297 **8 Claims**



1. In a combined sheet inverter and sorter comprising a plurality of sheet-receiving bins, conveyor means opposite the bins for advancing sheets in one direction past the bin openings, and a deflector associated with each bin for guiding a sheet into the bin, the improvement including means for mounting each deflector to permit a sheet to travel past the bin opening in said one direction but to guide a sheet travelling in the opposite direction into the bin, said conveyor means including means adapted to reverse the direction of sheet movement for feeding sheets into the bins, and control means associated with said conveyor means for controlling the operation of the conveyor means so that each sheet is reversed when its trail edge is located between a pair of adjacent deflectors whereby the sheets may be guided into selected bins in accordance with a predetermined sequence.

4,428,573

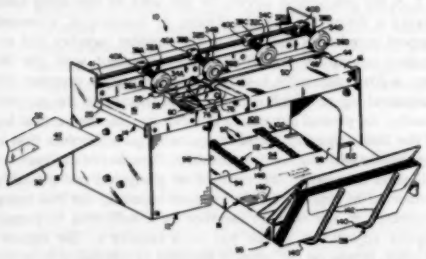
MAIL HANDLING APPARATUS

Philibert E. Denison, III, Stamford, and George Branecky, Bethel, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 67,851, Aug. 20, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 272,955

Int. Cl.³ B65H *29/58*

U.S. Cl. 271—305 **6 Claims**



1. Apparatus for handling mailpieces, comprising:

a. a feed deck including an upright wall;

b. means for successively feeding mailpieces downstream on said feed deck, said feeding means including means for drivingly engaging the lower major surface of respective mailpieces, said mailpiece feeding means including directional feed roller means, said feed roller means including a flexible shaft, said feed roller means including a metal roller attached to one end of said shaft for rotation with respect thereto, the other end of said shaft fixedly mounted for normally disposing said shaft at an angle with respect to a horizontal plane and disposing said roller at an angle with respect to said engaging means for urging said roller into engagement with the upper major surfaces of respective mailpieces engaged by said engaging means such that said feed roller cooperates with said mailpiece engaging means for urging engaged mailpieces toward said upright wall for edge registration thereagainst of respective mailpieces on said feed deck;

c. means for selectively gating mailpieces from said deck; and

d. means for stacking gated mailpieces on edge at a receiving station.

4,428,574

PAPER DELIVERY APPARATUS FOR USE IN ROTARY PRINTING PRESSES

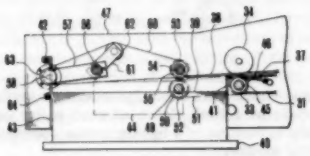
Yoshitaka Kataoka, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 307,853

Claims priority, application Japan, Nov. 29, 1980, 55-168444

Int. Cl.³ B65H *29/40*

U.S. Cl. 271—307 **2 Claims**



1. For use in a printing press of the type wherein a printed paper web is subdivided by a cutter into sheets of a predetermined uniform length and the sheets are accumulated in a pile on a vertically adjustable elevator, the improvement comprising:

endless guide belts overlying said elevator and having their lower runs running in a sheet delivery direction;

means for receiving said sheets from said cutter and for conveying the same in said sheet delivery direction for discharge beneath the lower runs of said guide belts;

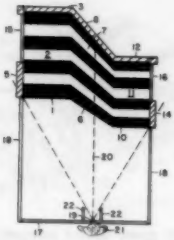
means for directing a flow of air upwardly towards the lower runs of said guide belts to urge said sheets into contact therewith, whereupon said sheets continue to be conveyed by the lower runs of said guide belts in said sheet delivery direction;

a vertical aligner at one side of said elevator, said aligner being positioned to be encountered by the leading edges of the sheets being conveyed by the lower runs of said guide belts and to thereby stop further movement of said sheets in said sheet delivery direction, the thus stopped sheets being thereafter free to drop towards said elevator;

a first brush roller having bristles arranged to contact the leading edges of the sheets being conveyed by the lower runs of said guide belts, said first brush roller being driven in a direction causing its bristles to eliminate upward curl of the leading edges; and

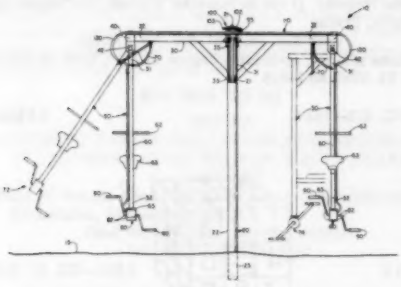
a second freely rotatable brush roller having bristles arranged to contact and to eliminate and downward curl of the leading edges of sheets accumulating on said elevator.

4,428,575
OPTICAL ILLUSION CHAMBER
James S. Kerr, 1117 Wiltshire, San Antonio, Tex. 78209
Filed Sep. 29, 1982, Ser. No. 427,795
Int. Cl.³ A63J 5/00
U.S. Cl. 272—8 R 11 Claims



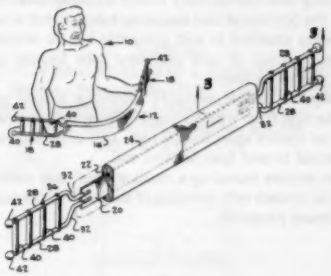
1. An optical illusion device consisting of two regularly constructed end sections having a predetermined size differential, each of said end sections having its own level floor being on a horizontal plane at right angles to the plumb and sized to accomodate a person thereon, said end sections being connected by a distorted center section, a peephole located forward of said two regularly constructed end sections, a viewing of said optical illusion device from said peephole producing a false perspective that said two regularly constructed end sections appear to be of equal size.

4,428,576
SUSPENDED CYCLE RIDING DEVICE
James L. Fisher, Jr., 4510 N. Hughes, Fresno, Calif. 93705
Filed Nov. 30, 1981, Ser. No. 325,830
Int. Cl.³ A63G 1/12, 1/28
U.S. Cl. 272—33 R 7 Claims



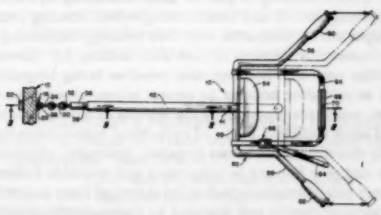
1. A suspended cycle riding device comprising
A. a column fixed in an upright disposition and having an upper portion;
B. an arm extended substantially horizontally from the upper portion and mounted thereon for rotation about the column;
C. a cycle frame pendantly supported on the arm for rotation with the arm about the column;
D. support means mounted on the frame for supporting an operator for movement therewith;
E. pedal means mounted on the frame for pedaling by an operator at the support means; and
F. drive means for rotationally driving the arm about the column with the frame moving in a circular orbit thereabout, the drive means including a hydraulic pump mounted on the frame in driven relation to the pedal means, a hydraulic motor mounted on the arm for rotation therewith and having a rotational output shaft, hydraulic conduit means for hydraulically connecting the pump and the motor so that the shaft is rotationally motivated by the pump, and means connecting the shaft and the column for rotating the arm about the column when the shaft is motivated by the pump.

4,428,577
EXERCISER
Wilfred W. Weingardt, Cedar Crest, N. Mex., assignor to Michael Croom and Harold Weingardt, both of Albuquerque, N. Mex., part interest to each
Filed Jul. 25, 1979, Ser. No. 60,810
Int. Cl.³ A63B 21/32
U.S. Cl. 272—135 3 Claims



1. An exercise device comprising an elongated spring blade having first and second ends, first and second handle means respectively connected to said first and second ends of said elongated spring blade and protective cushion means enclosing said elongated spring blade for protecting the user against accidental injury thereby, wherein said elongated spring blade is a rectangular relatively thin metal blade, said first and second handle means each comprises a plurality of individual tubular hand grip members mounted on first and second support rods attached to each end of the elongated spring blade and extending parallel to and fixedly positioned with respect to each other and progressively spaced away from one end of said blade to which their respective first and second support rods are connected, said protective cushion means comprises a foam rubber pad encased in a protective fabric cover and further including a cushion cap member mounted on the outer end of each of said rod members.

4,428,578
EXERCISING DEVICE
Thomas L. Kirkpatrick, 3509 Quincy Ave., Simi Valley, Calif. 93063
Filed Jun. 15, 1981, Ser. No. 273,582
Int. Cl.³ A63B 21/04
U.S. Cl. 272—136 6 Claims



1. In combination, an exercising device to attachable to a door comprising:

an attaching bracket assembly for removably securing said exercising device to a door;

a connecting means for connecting the exercise device to said bracket assembly;

an elongated stretchable cord having an outer end and a inner end, said outer end attached to said connecting means, said connecting means being removably connected to said attaching bracket assembly;

a graspable handle assembly attached to said inner end of said elongated stretchable cord, manual movement of said handle assembly is capable of causing stretching of said stretchable cord;

said stretchable cord being mounted within an enclosing tube that extends substantially from said inner end to said outer end, with said stretchable tube in its at-rest position the said enclosing tube substantially totally encasing said stretchable cord, the portion of said enclosing tube located at said inner end being attached to said graspable handle assembly with another portion of said enclosing tube located near said outer end being free;

said graspable handle assembly including a rigid elongated apex section from which extends substantially perpendicular a pair of spaced-apart handle rods, said enclosing tube being connected to said apex section; and

said apex section including a cushiony pad, said cushiony pad being in contact with portions of the body of the user during an exercise program.

4,428,579

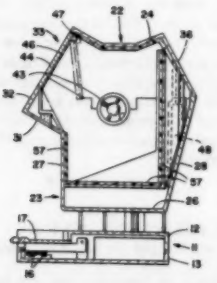
DICE AGITATION AND CASTING APPARATUS

Albert J. Miller, Campbell, Calif., assignor to Atlas Electronics International, Inc., Los Gatos, Calif.

Filed Apr. 12, 1982, Ser. No. 367,435

Int. Cl.³ A63F 9/04

U.S. Cl. 273—145 CA **5 Claims**



1. A device for agitating, casting, and displaying dice, including a base housing, a pair of arms extending upwardly from opposed sides of said base housing, a dice housing rotatably supported by said arms, said dice housing comprising a closed chamber, a window in said dice housing for viewing dice within said dice housing, said window being hingeably secured to said dice housing to permit access to said closed chamber, means for illuminating the interior of said dice housing, said arms including a pair of cylindrical bosses extending inwardly therefrom, said bosses engaging generally cylindrical holes in said dice housing in supporting and rotatable fashion, one of said pair of bosses including an electrical lamp assembly fixedly secured therein and disposed to illuminate the interior of said dice housing, a battery disposed in said base housing, and a pushbutton switch connected to said battery and said lamp.

4,428,580

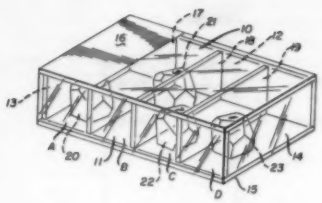
VARIABLE DICE GAME DEVICE

Anthony Pasquine, 1750 Lucretia Dr., Girard, Ohio 44420

Filed Sep. 13, 1982, Ser. No. 416,886

Int. Cl.³ A63F 9/04

U.S. Cl. 273—145 C **6 Claims**



1. A variable dice game device comprising a substantially rectangular closed hollow transparent housing defined by top and bottom portions, oppositely disposed sides and oppositely disposed ends spacing said top and bottom portions and a plurality of transverse intersecting partitions arranged in equally spaced relation to one another and said ends and forming four elongated cross sectionally square hollow compartments, a light impervious panel affixed to said top portion in registry with one of said hollow compartments and a game piece comprising a ten-sided die freely positioned in each of said four hollow compartments, indicia on each of the ten-sides of each of said dies whereby three of said dies may be viewed through the top portion of said device and four of said dies may be viewed through the bottom portion of said device.

4,428,581

TRI-DIMENSIONAL PUZZLE

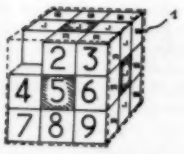
Gabriel Nagorny, 21 rue du Marechal Vaillant, 130 Nogent-sur-Marne, France

Filed Jun. 16, 1981, Ser. No. 274,169

Claims priority, application France, Jun. 19, 1980, 80 13578; Nov. 19, 1980, 80 24515

Int. Cl.³ A63F 9/08

U.S. Cl. 273—153 S **6 Claims**



1. A tridimensional puzzle comprising n identical parallelepipedic elements; and

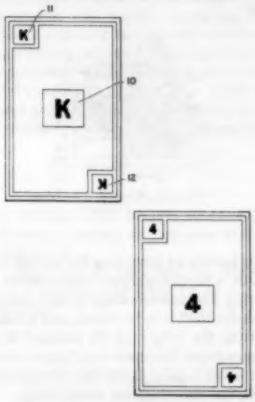
a transparent parallelepipedic box whose sides are multiples of those of one element and whose volume is roughly equal to that of n+1 elements, the volume of one element being left vacant in the box thus allowing the displacement of at least some of the elements and the value of the multiples being such that at least two of the n elements do not come into contact with any edge of the box, only the elements located along the edges of the box being free to be moved, the other elements together forming a permanent structure which is deformable because of the loose assembly between its elements, this assembly being obtained by means of a junction with clearance between the control element(s) and the adjacent ones.

4,428,582

APPARATUS FOR EDUCATIONAL GAMES

William Smith, 15040 Sprague Rd., Cleveland, Ohio 44130

Filed Sep. 23, 1981, Ser. No. 304,861
Int. Cl.³ A63F 1/04
U.S. Cl. 273—296 7 Claims



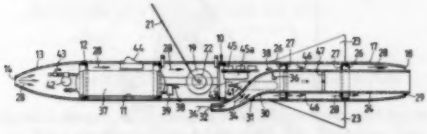
1. Playing apparatus comprising a set of playing pieces, each said piece being generally flat and having a top and a bottom side, said top side bearing thereupon a letter indicium or indicia corresponding to one letter of an entire alphabet, but bearing no number, and said bottom side bearing thereupon a number indicium or indicia corresponding to one number from a fixed preselected set of numbers, but bearing no letter, and in which for each selection of one letter of said entire alphabet and one number from said set of numbers, there is one and only one playing piece in said set having said letter on its top side and said number on its bottom side, the number of pieces in said set of playing pieces therefore being equal to the number of letters in said entire alphabet multiplied by the number of numbers in said fixed preselected set of numbers, said number of numbers in said set being in excess of one.

4,428,583

AIRBORNE TARGET FOR GENERATING AN EXHAUST PLUME SIMULATING THAT OF A JET POWERED AIRCRAFT

Hugh B. Feagle, Leeds, Ala., assignor to Hayes International Corporation, Birmingham, Ala.

Filed Nov. 19, 1982, Ser. No. 443,056
Int. Cl.³ F41J 9/08, 9/10
U.S. Cl. 273—348.1 8 Claims



1. An airborne target for generating an exhaust plume simulating that of a jet powered aircraft, comprising:

(a) an elongated target body carrying a longitudinally extending combustion chamber and having an air receiving inlet facing in the direction of travel of said body and in communication with the forwardmost end of said combustion chamber, with there being an outlet at the rearmost end of said combustion chamber for exhausting said plume,

(b) means between said air receiving inlet and said forwardmost end of said combustion chamber for increasing the expansion of a stream of air flowing therethrough and for reducing the velocity thereof,

(c) fuel injection means carried by said body in position to inject hydrocarbon fuel at a predetermined rate under pressure into said stream of air to provide a predetermined fuel-air mixture,

(d) at least one igniter carried by said body for igniting said fuel-air mixture, and

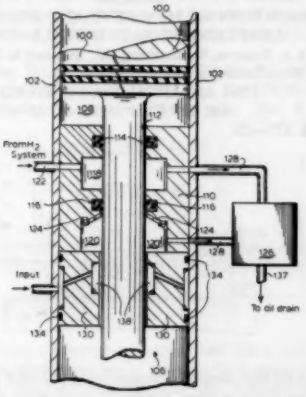
(e) a flame holder carried by said body rearwardly of said igniter in position for the ignited fuel-air mixture to attach thereto and provide sustained burning after the igniter is spent and produce an exhaust plume of a predetermined length which simulates the same spectral distribution of infrared energy as that produced from a jet engine burning the same fuel.

4,428,584

PISTON ROD SEAL FOR A STIRLING ENGINE

Wilbur Shapiro, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 2, 1982, Ser. No. 354,018
Int. Cl.³ F16J 15/56
U.S. Cl. 277—3 7 Claims



1. For use in association with a piston rod in sealing a piston in a cylinder, a piston rod sealer comprising:

a sealing means having two opposite sides, a first side of which is exposed to a first pressurized fluid and a second side of which is exposed to a second pressurized fluid, said sealing means being adapted to have a piston rod passing therethrough;

a pressurized means adapted to supply the second pressurized fluid to the second side of said sealing means; and

a differential regulating valve means coupled to each side of said sealing means and capable of removing high pressure differentials therebetween during operation of the piston so as to inhibit leakage past the sealing means.

4,428,585

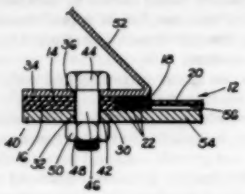
PERMEABLE MEMBRANE SEAL ASSEMBLY

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,044
Int. Cl.³ B61D 7/22; F16J 15/06
U.S. Cl. 277—12 17 Claims

1. A permeable membrane seal comprising: a body portion made of elastomeric material; said body portion including an elongated slot to receive a permeable membrane; said mem-

brane held in place with stitches of threads which extend through the body portion and permeable membrane; whereby said stitched threads substantially prevent a flow path of fluid-



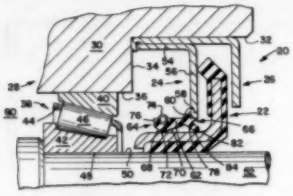
izing media from the permeable material vertically and said elastomeric body portion prevents a flow of fluidizing media laterally through said body portion.

4,428,586

COMBINATION WEAR SLEEVE AND EXCLUDER LIP ADAPTED FOR EASY INSTALLATION

Richard A. Romero, Schaumburg, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Apr. 4, 1983, Ser. No. 481,983
Int. Cl.³ F16J *15/32, 15/34*
U.S. Cl. 277—25 **9 Claims**



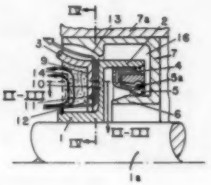
1. An oil seal assembly comprising a seal unit having a seal mounting flange portion, a radial flange portion, and a primary seal lip body bonded to a part of said radial flange, said seal lip body having oil and air side frusto-conical surfaces meeting to define a primary seal band, said radial flange also including an exterior surface portion adapted to engage and cooperate with an excluder lip to form an end face seal for protecting said primary seal lip against contamination, and an excluder unit comprising an annular casing with an axial flange having radially inner and outer surfaces and a radial flange portion, an elastomeric casing positioning sleeve having its outer diameter bonded to aid radially inwardly directed portion of said excluder component axial flange and its inner diameter adapted to be received in a snug but removable sealing engagement over an associated shaft, said excluder casing having its radially outwardly directed surface adapted to engage said seal band on said primary sealing lip body in snug sealing engagement, said excluder further including an excluder lip extending generally radially outwardly of said excluder casing and axially toward said exterior surface portion of said radial flange of said sealing unit, so as to engage said exterior surface in said face sealing engagement, with said excluder lip being adapted to contact said exterior surface with a first force in a static condition, and to deflect axially partially away from said exterior surface under an applied centrifugal force so as to reduce said first force on said exterior surface to a force of reduced value.

4,428,587

SEAL RING WITH CHANNEL FOR RADIALLY ACCELERATING MEDIUM TO BE SEALED

Hans Forch, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,391
Int. Cl.³ F16J *15/42, 15/32*
U.S. Cl. 277—25 **20 Claims**



1. In a seal ring having an inner ring for sealing to a shaft and rotation therewith, a porous compact ring portion of the inner ring, an outer ring for non-rotating, sealed connection to a housing in which the shaft is to be sealed, and a radial shaft seal ring extending from the inner ring for rotation therewith to a lip which sealing engages the outer ring below a nominal speed of rotation and centrifugally separates therefrom at higher rotational speeds, the improvement comprising:

means in the inner ring forming at least one generally radial channel axially inward of the compact and axially closed therebeyond and extending to an open, radially-outer discharge end thereof for radially accelerating medium to be sealed which penetrates the compact to the channel upon rotation of the inner ring; and

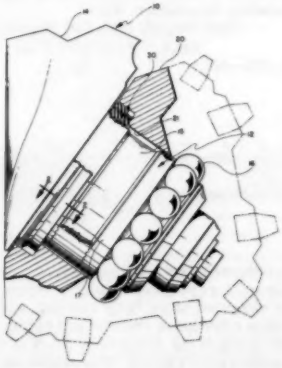
an annular impingement surface means on the outer ring spaced a small distance from the discharge end of the channel at an obtuse angle to the channel and extending therefrom generally axially about the compact ring for directing the radially accelerated medium from the channel therealong.

4,428,588

RADIAL BELLEVILLE SEAL WITH ENCAPSULATED RESILIENT CORE MEMBER

Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Sep. 7, 1982, Ser. No. 415,081
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—83 **17 Claims**



1. In a machine having a first member rotatably mounted with respect to a second member defining therebetween an

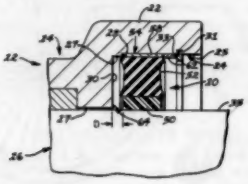
annular seal gland groove, an annular resilient seal packing ring rotatable in said seal gland groove, said annular seal packing ring in a relaxed condition having a cross-sectional form of a parallelogram displaced radially with a total radial cross-sectional dimension greater than a radial cross-sectional dimension of said seal gland groove, said annular seal packing ring having in cross section two extreme diagonally opposite corners biased against said axially extending annular surfaces formed between said first and second members, said packing ring forming a couple, said packing ring having a resilient core member encapsulated within said ring, said packing ring being elastically deformable in cross section when confined within said seal gland groove from said parallelogram form toward a substantially rectangular form of reduced radial cross-sectional dimension.

4,428,589

DUAL OPERATING MODE SEAL ASSEMBLY

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 4, 1983, Ser. No. 481,602
Int. Cl.³ F16J *15/24*
U.S. Cl. 277—101 **11 Claims**



1. A radial seal assembly (10) adapted for sealing a movable member (16), comprising:
an inner seal ring (50) positionable about said member (16);
said seal ring (50) being of a tough, abrasion resistant material having a predetermined static coefficient of friction with said member (16);
an elastomeric load ring (52) secured about said seal ring (50);
means (54) for maintaining the load ring (52) in a radially compressed condition;
said compressed condition of said load ring (52) in conjunction with said predetermined static coefficient of friction, providing a frictional force between said seal ring (50) and said member (16) sufficient to maintain said seal ring (50) in a static sealing mode relative to said member (16) during either movements of said member (16);
said elastomeric load ring (52) having a shear force developed in response to extended travel movements of said member; and,
said shear force being sufficient for overcoming said frictional force at a predetermined slip point.

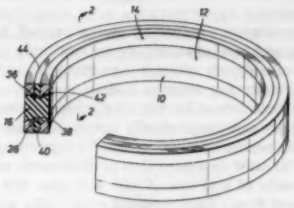
4,428,590

ANTI-EXTRUSION SEALING DEVICE WITH HINGE-LIKE BRIDGE SECTION

Aaron J. Pippert, Houston, and H. T. Miser, Missouri City, both of Tex., assignors to Utex Industries, Inc., Houston, Tex.

Filed Nov. 19, 1981, Ser. No. 322,727
Int. Cl.³ F16J *15/18*
U.S. Cl. 277—188 A **15 Claims**

1. A sealing device comprising:
a first relatively rigid, integral anti-extrusion body having female interlock formations thereon and a base surface, said base surface having a central groove therein, said first body further comprising a pair of side sections disposed on opposite sides of said groove and a bridge section connecting said side sections across the bottom of said groove, said bridge section being adapted to provide a hinge-like action permitting movement of said side sections toward and away from each other in the vicinity of said base surface;



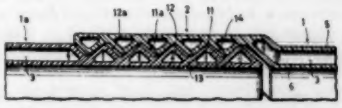
and a second relatively flexible, integral sealing body having interlock formations matingly engaging the interlock formations of said first body to permanently mechanically interlock said bodies and a sealing portion disposed on the opposite side of said first body from said base surface.

4,428,591

PLASTIC PIPE PROVIDED WITH A GROOVE

Roelof H. Marissen, Bergentheim, and Joannes H. Beune, Hardenberg, both of Netherlands, assignors to Wavin B.V., Netherlands

Division of Ser. No. 108,050, Dec. 28, 1979, Pat. No. 4,338,716. This application May 17, 1982, Ser. No. 379,001
Claims priority, application Netherlands, Jan. 9, 1979, 7900173
Int. Cl.³ F16J *15/10*
U.S. Cl. 277—207 A **3 Claims**



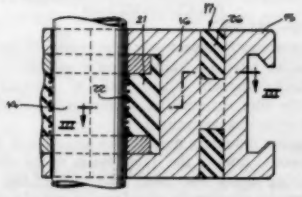
1. A plastic pipe comprising an inner wall and an outer wall, having longitudinal partitions in between them and being integral with said inner wall and said outer wall, bounding longitudinally extending channels and a helically extending internal groove, made by pressing channel walls onto each other at least at a distance from the pipe end and maintaining the channels beside the internal groove.

4,428,592

MESH REINFORCED ELASTOMERIC ELEMENT FOR OIL WELL COMPONENTS

Charles D. Shaffer, 1119 N. Raymond Ave., Fullerton, Calif. 92631

Filed Jun. 7, 1982, Ser. No. 385,563
Int. Cl.³ F16J *15/22*; E21B *33/06*
U.S. Cl. 277—230 **8 Claims**



2. In a sealing means for well apparatus, the combination of:

a body means of elastomeric material having a resilient yieldable sealing face for engagement with a cylindrical surface of a well pipe to be sealed under conditions of longitudinal and rotational relative movement there between;

and pre-shaped reinforcing means carried by, imbedded with, and bonded to said elastomeric body member at the side of said body which is in proximity to said sealing face, said reinforcing means including

a wire mesh lamina having wire lamina elements extending laterally and longitudinally across said elastomeric body means behind said sealing face for supporting said sealing face to resist unwanted flow of elastomeric material longitudinally of said axis of said well pipe and to resist unwanted flow of said material rotationally with respect to said axis, and to provide a wear resistant composite sealing face.

4,428,593

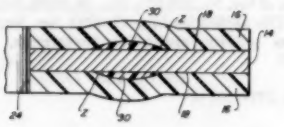
GASKET ASSEMBLY HAVING IMPROVED SEALING CHARACTERISTICS AND METHOD OF MAKING SAME

Robert S. Pearlstein, Mount Prospect, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Continuation-in-part of Ser. No. 282,262, Jul. 10, 1981. This application Sep. 15, 1981, Ser. No. 302,692

Int. Cl.³ F16J *15/06, 15/10*

U.S. Cl. 277—235 B **15 Claims**



1. A gasket assembly for disposition between a pair of surfaces to be sealed and to be compressed therebetween comprising:

a pair of gasketing layers laminated to each other, one of said layers being of a compressible material and the other being metallic,

a sealing pattern of a substantially incompressible material disposed between said layers and enveloped between said layers,

at least one opening in said gasket assembly about which said sealing pattern is disposed,

whereby in use said incompressible sealing pattern is protected from direct contact with said surfaces to be sealed and enhances the sealing characteristics of said gasket assembly.

4,428,594

WHEEL ASSEMBLIES FOR USE WITH WHEELCHAIRS

Jeffrey P. Minnebraker, Westlake Village, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 206,346, Nov. 13, 1980, Pat. No. 4,351,540. This application May 24, 1982, Ser. No. 381,008

Int. Cl.³ A61G *5/04*

U.S. Cl. 280—242 WC **45 Claims**

16. An apparatus for selectively positioning the front wheels of a wheelchair having a frame means to selectively alter the angle of attack of the wheelchair relative to a ground plane and to selectively alter the steering characteristics of the wheelchair, said apparatus comprising:

(a) a separate mounting member for securement to each of the opposite sides of the frame means of the wheelchair,

(b) receiving means associated with each of the mounting members for receiving a wheel post in any of a plurality of angular positions relative to the ground or other supporting surface,

(c) a separate wheel supporting post adapted for connection to said receiving means,

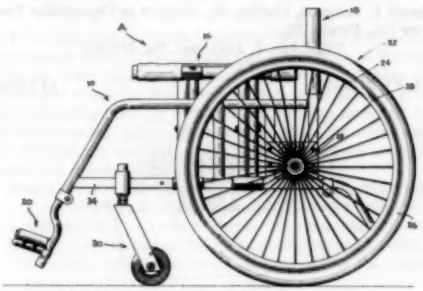
(d) a separate yoke carried by each of said posts and being rotatable about a generally vertical axis relative to the associated wheel post housing, and each of said yokes having a pair of spaced apart plates with a pair of aligned apertures in said spaced apart plates, and

(e) a separate wheel and axle for each said yoke and each axle capable of being disposed in the aligned apertures, and where the angle of the wheel post relative to the frame means can be adjusted to affect steering and riding characteristics.

30. A wheel assembly for use with wheelchairs, said wheel assembly comprising:

(a) a wheel post housing,

(b) mounting means for mounting the wheel post housing to a frame of a wheelchair,



(c) a yoke operatively coupled to said wheel post housing for rotation about a generally vertical axis,

(d) a wheel and axle arrangement carried by said yoke,

(e) a locking device operatively mounted on said assembly and having a locking pin capable of being engagable with a notch associated with said yoke and preventing rotation of said yoke when said locking pin is in said notch,

(f) an engagable portion on said locking pin for engagement by a user to manually move said pin to the position where it is engagable with said notch,

(g) a locking element associated with said pin to hold same in a locked position, and

(h) release means operatively associated with said locking element and being manually operable to prevent said locking element from holding the pin in the locking position.

4,428,595

FIFTH WHEEL HITCH

Samuel A. Martin, Holland, and Fredrick J. Bakker, West Olive, both of Mich., assignors to Holland Hitch Company, Holland, Mich.

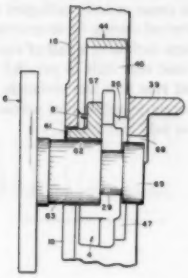
Filed Mar. 1, 1982, Ser. No. 353,038

Int. Cl.³ B62D *53/10*

U.S. Cl. 280—435 **14 Claims**

1. In a fifth wheel hitch having a support plate with an upper bearing surface and kingpin slot therethrough, and a pair of pivotally mounted jaws which are closed to define a socket in which a kingpin is retained in a locked position, and are opened to release said kingpin in an unlocked position; said socket having a generally vertically oriented central axis, and forward and rearward halves which define therebetween a fore-to-aft dimension and a side-to-side dimension; means for adjusting the angular position of said jaws in the closed, locked position for varying the side-to-side dimension of said socket to compensate for side wear in said hitch, the improvement comprising:

a stationary bearing connected with said hitch, and having an arcuate plan shape which mates with said kingpin and forms at least a portion of the forward half of said socket; said bearing being fixed during hitch loading with respect to the central axis of said socket, whereby pivotal adjustment of said jaws varies the fore-to-aft dimension of said socket to compensate for end wear in said hitch; said stationary bearing extending upwardly through said kingpin slot to an elevation slightly below the upper bearing surface of said support plate for improved wear resistance.

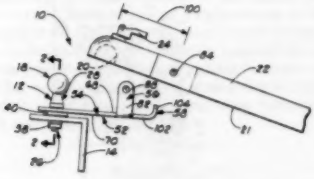


4,428,596

TRAILER SAFETY HITCH

Tommy G. Bell, 2715 N. Emerson, and Lloyd Bell, P.O. Box 552, Suburban Trailer Park, both of Enid, Okla. 73701

Filed Mar. 12, 1982, Ser. No. 357,427
Int. Cl.³ B60D *1/12*
U.S. Cl. 280—507 **7 Claims**



1. A safety hitch for securing a trailer tongue, having a ball receiving socket formed in the under side thereof, to a towing vehicle, comprising:

a circular hitch member having a relatively small diameter shank member surmounted by a larger diameter ball member, the shank member adapted for mounting on the towing vehicle; and

a safety connector, comprising:

a base plate having an elongated slot formed therethrough, portions of the slot near a first end thereof dimensioned to pass the ball member therethrough and portions of the slot near an opposed second end thereof dimensioned to pass the shank member therethrough but of insufficient dimensions to pass the ball member therethrough;

means for pinning the trailer tongue to the base plate in an overlaying relation to the base plate for pivotation of portions of the trailer tongue wherein the socket is moved toward and away from the base plate and for concurrently positioning the socket above portions of the slot near the second thereof; and

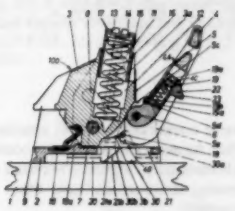
means, adapted to engage the trailer tongue at such times that the trailer tongue is pinned to the base plate, for limiting pivotation of portions of the trailer tongue, wherein the socket is formed, away from the base plate.

4,428,597

HEEL HOLDER FOR A SAFETY SKI BINDING

Heinz Wittmann, and Vladimir Konwitza, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Nov. 4, 1981, Ser. No. 318,243
Claims priority, application Austria, Nov. 7, 1980, 5473/80
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—626 **9 Claims**



1. In a heel holder for a safety ski binding, in particular for a safety ski binding for both cross-country skiing and downhill skiing, said heel holder having a bearing block fixed relative to the ski and a housing which carries a sole holder thereon, said housing being supported for pivotal movement upwardly at the ski boot engaging part thereof about an axis provided on the bearing block and extending transversely with respect to the longitudinal axis of the ski and against the force of a spring arranged in a spring chamber which is constructed in said housing, one end of said spring being supported on a housing-fixed part and the other end being supported on an adjustable abutment which is held on the bearing block, a two-arm release lever which is hingedly connected to the bearing block, wherein a control bolt which is held on the housing is guided along at least one control cam surface arranged on two sidewalls of the bearing block, the improvement comprising wherein each control cam surface is constructed on the inner side of the sidewall of the bearing block, wherein the pivot axis of the housing is arranged at the upper region of the bearing block, and wherein said pivot axis is offset rearwardly relative to the control bolt.

4,428,598

BABY CARRIAGE

Kenzou Kasai, Osaka, Japan, assignor to Kasai Kabushikikaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,667
Claims priority, application Japan, Jul. 27, 1981, 56-118727; Feb. 9, 1982, 57-20051
Int. Cl.³ B62B *7/06*
U.S. Cl. 280—644 **10 Claims**

1. A baby carriage comprising:

a pair of forwardly and downwardly extending front legs (10) each in the form of a single, substantially straight bar,

a pair of rearwardly and downwardly extending rear legs (14) pivotally connected at their upper ends (15) to said front legs (10),

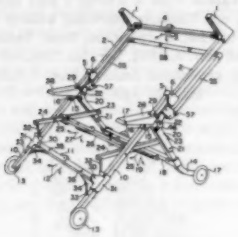
a pair of support angle bars (20) pivotally connected at their lower ends (21) to the middle regions of said rear legs (14),

a pair of pusher rods (2) pivotally connected at their lower ends to the upper ends (22) of said support angle bars (20),

a slidable and pivotal connecting member (5) for slidably and pivotally connecting the upper end of each said front leg (10) to the associated pusher rod (2), and

a pair of transverse connecting rods (24) for operatively connecting said front legs (10) and said support angle bars (20) together,

one of said front legs (10), one of said rear legs (14), one of said pusher rods (2) and one of said transverse connecting rods (24) constituting one lateral surface forming structure, the other front leg (10), rear leg (14), pusher rod (2)



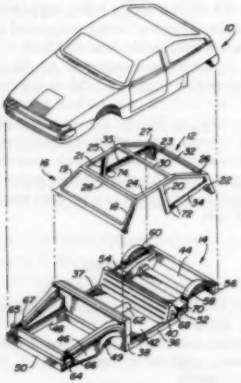
and transverse connecting rod (24) constituting the other lateral surface forming structure, with connecting rods (4, 11, 18, 26) horizontally extending between said one lateral surface forming structure and said other lateral surface forming structure.

4,428,599

FRONT AND REAR ENERGY ABSORBING STRUCTURES FOR A FOUR PASSENGER VEHICLE

Herbert A. Jahnle, Havertown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Feb. 1, 1982, Ser. No. 344,731
Int. Cl.³ B62D 21/00
U.S. Cl. 280—784 3 Claims



1. A four passenger automobile comprising:

(a) a main platform including front and rear passenger compartments, a fire wall, and a bulkhead disposed between said front and rear floor areas;

(b) an open frame secured to said platform to receive panels thereon;

(c) a pair of front side rails extending from said firewall;

(d) a front bumper secured to said front side frames;

(e) said front side rails having front indentations therein in the areas in close proximity to said bumpers;

(f) a pair of rear side rails extending from said bulkhead;

(g) a rear bumper secured to said rear side rails;

(h) said rear side rails having rear indentations therein in the areas in close proximity to said bulkhead;

(i) wheel well structures secured to said rear side rails between said bulkhead and said rear bumper with said rear indentations being disposed between said wheel well structures and said bulkhead;

(j) said pair of front side rails including front wheel well structures disposed between said front indentations and side firewall;

(k) said front and rear side rails extending substantially horizontally in straight lines from the front and rear of the automobile to cause orderly collapses of said side rails as energy is absorbed during front or rear impacts; and

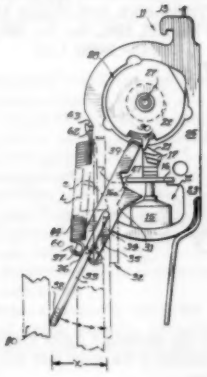
(l) said open frame including a pair of rear belt line elements spaced over said rear rails in parallel relationship therewith with said rear belt line elements each including indentations therein in substantial vertical alignments with indentations in said rear rails.

4,428,600

TENSION RELEASE DEVICE WITH REDUCED DOOR CLOSING RESISTANCE

Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Chicago, Ill.

Filed Jul. 6, 1982, Ser. No. 395,356
Int. Cl.³ A62B 35/02
U.S. Cl. 280—802 13 Claims



1. A safety belt retractor for a vehicle having a door comprising:

a rotatable reel having a belt wound thereabout for protraction and retraction from the reel;

spring means biasing the reel to retract and to rewind the belt into the reel;

tension relieving means movable from an inoperative position to an operative position for relieving the belt tension being exerted on the protracted belt by said return spring;

actuating means for actuating the tension relieving means to cause the belt to automatically rewind, the actuating means being held by a vehicle door in a non-actuating position until the door is opened, and

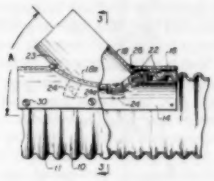
biasing means biasing the actuating means to actuate the tension relieving means from the operative to the inoperative position to cause automatic rewind of the belt onto the reel;

said biasing means exerting a force on the vehicle door which diminishes as the door moves to its closed position.

4,428,601
Y-CONNECTION FOR FLEXIBLE CONDUIT

Robert Rice, P.O. Box 454, San Martin, Calif. 95046, and Robert Ferreira, 2885 Hay Loft Way, Morgan Hill, Calif. 95037

Filed Feb. 9, 1981, Ser. No. 232,863
Int. Cl.³ F16L 41/00
U.S. Cl. 285—197 4 Claims



1. An apparatus for connecting a branch conduit in flow communication with a main conduit that has an aperture therein, backing means positionable against the inner surface of said main conduit in the marginal area around the aperture therein, an apertured saddle positionable against the outer surface of the main conduit with the aperture in the saddle registering with the aperture in the main conduit, the main conduit being disposed between said backing means and said saddle without any portion of said backing means interpenetrating into said saddle, means for securing the branch conduit to said saddle, and means for securing said saddle and said backing means to said main conduit with the main conduit disposed between said backing means and said saddle and with the branch conduit in flow communication with the interior of the main conduit through the aperture in the main conduit, said means for securing the branch conduit to said saddle including a plurality of tabs formed to extend longitudinally of the conduit on the end of the branch conduit that is to be connected to said saddle, each tab being adapted to be inserted through the aperture in said saddle and bent back against the inner concave surface of the saddle, said securing means for securing said branch conduit to said saddle further including fastening means for securing each tab to said saddle.

4,428,602
INNER TUBE ELEMENT FOR A DOUBLE TUBE CORING APPARATUS AND PROCESS FOR THE MANUFACTURE OF THIS TUBE ELEMENT

Honore J. Lambot, Wauthier-Braine, Belgium; Maria J. H. Fliervoet, Zwolle, and Pieter Kramer, Hardenberg, both of Netherlands, assignors to Societe Anonyme Diamant Boart, Zwolle, Netherlands

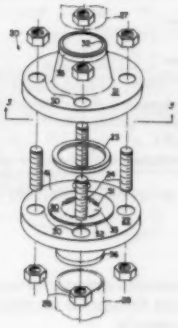
Filed Dec. 28, 1981, Ser. No. 335,031
Claims priority, application Belgium, Dec. 30, 1980, 203359
Int. Cl.³ F16L 47/00, 55/00, 25/00
U.S. Cl. 285—239 6 Claims

1. An inner tube element for a double tube coring apparatus for mining or petroleum drilling, said apparatus comprising an outer tube surrounding an inner tube including inner tube elements coupled to one another by steel nipples, wherein each inner tube element consists of a tube length made of synthetic resin reinforced with fibers and overlaps, at each of its ends, a part of a nipple, the internal diameters of the nipples and the tube length being substantially equal, characterized in that said nipples have a rough external surface, that said fibers grip said rough external surface of the nipples in order to secure the tube length thereto, and that said inner tube element presents over its whole length a constant section, the external diameter of which is substantially equal to the external diameter of the nipples.

4,428,603
FLANGE UNION WITH IMPROVED METAL-TO-METAL SEALS

Irwin H. Davlin, 714 S. Court St., Opelousas, La. 70570

Filed Dec. 9, 1980, Ser. No. 214,861
Int. Cl.³ F16L 23/00, 25/00, 13/14, 55/00
U.S. Cl. 285—368 29 Claims



1. A flange union comprising first and second cooperating flange members having inner and outer ends and alignable annular bores extending longitudinally therethrough which serve as a passageway for fluid, the said first flange member having an annular groove formed in its terminal inner end surface, the said groove having abottom annular surface with inner and outer edges extending around the terminal inner end of the bore in the first flange member and being spaced outward therefrom a substantial distance, an annular protrusion extending axially beyond said terminal inner surface and having an annular first sealing surface thereon of decreasing diameter, the said annular protrusion commencing at said inner edge of the bottom annular surface of the said groove and sloping toward the terminal inner end surface of the first flange member and terminating substantially at the internal diameter of the bore thereof, an annular bevel extending around the bore in the first flange member and being spaced therefrom, the said bevel commencing at said outer edge of the bottom annular surface of the said groove and sloping toward the terminal inner end surface of the first flange member and away from the internal diameter of the bore thereof, the said bevel terminating at the said terminal inner end surface of the first flange member and having an annular second sealing surface thereon, the terminal inner end surface of the second flange member having an annular shoulder which surrounds the said bore therein, the annular inner edge of the said shoulder terminating in an annular third sealing surface which cooperates with the said first sealing surface, the annular outer edge of the said shoulder terminating in an annular angular fourth sealing surface which cooperates with the said second sealing surface, the said first and second flange members being positioned whereby their respective bores are in communication and the terminal inner end surfaces thereof are opposite each other and whereby the said first and third sealing surfaces and the said second and fourth sealing surfaces are arranged in an opposed relationship, and means carried by the said first and second flange members

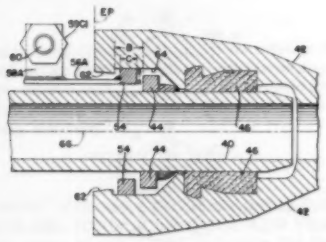
for applying inwardly directed force to the said first and third opposed sealing surfaces and the said second and fourth opposed sealing surfaces to thereby urge the same into effective first and second sealing relationships respectively and thereby form first and second annular seals respectively around the said terminal inner ends of each of the said bores and provide a fluid tight passageway for fluid through the flange union.

4,428,604

RESTRAINED PIPE JOINT AND ASSOCIATED SNAP-RING

Randall C. Conner, Birmingham, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Mar. 12, 1981, Ser. No. 242,925
Int. Cl.³ F16L *21/08*
U.S. Cl. 285—321 **15 Claims**



1. A pipe joint restrained against axial separation comprising:

a cylindrical socket having only continuous annular internal and external contours;

a cylindrical spigot extending into said cylindrical socket and including a spigot ring fixed to that part of the cylindrical spigot which is within the cylindrical socket;

a gasket sealing the joint between the cylindrical socket and the cylindrical spigot;

a ring assembly having a first part positioned within said socket and a second part positioned outside of said socket, said first part including a bearing ring having two ends at a split, and said bearing ring being positioned between the socket and said spigot ring fixed to the said cylindrical spigot, said bearing ring uniquely defining a plane, two transverse pieces for connecting said first part to said second part, each said transverse piece being attached to one of the two ends of said bearing ring and extending away from the plane defined by said bearing ring to a position outside of said socket, said second part including a ring adjustor, said ring adjustor being located outside of said socket and adapted to adjustably constrain the bearing ring by allowing adjustment of the diameter of the bearing ring, said ring adjustor including a lug on each of said two transverse pieces,

a threaded rod extending between the two lugs,

a first spreader nut on said threaded rod, said first spreader nut operable to expand the diameter of said bearing ring, and

a first closure nut on said threaded rod, said first closure nut operable to contract the diameter of said bearing ring; and

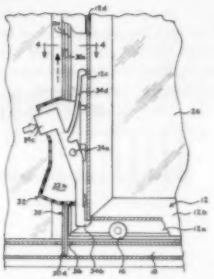
wherein said cylindrical socket includes a radially inwardly projecting lip portion adjacent its end, and wherein said bearing ring is rectangular in cross-section and has side surfaces bearing between cooperating surfaces of the spigot ring and said inwardly projecting lip portion of said cylindrical socket and wherein the application of axial forces tending to separate said cylindrical socket from said cylindrical spigot causes the bearing ring to rotate and wedge itself securely between the inwardly projecting lip portion and the spigot ring.

4,428,605

LATCHING DROP LOCK FOR SLIDING CLOSURE MEMBER

James S. Follows, Surrey, Canada, assignor to Vanguard Plastics Ltd., Surrey, Canada

Filed Apr. 1, 1982, Ser. No. 364,493
Int. Cl.³ E05C *1/10*
U.S. Cl. 292—152 **6 Claims**



1. A latching drop lock for a slidable closure member mounted for sliding movement in a fixed frame structure, said drop lock comprising:

lock body means slidably mountable on said closure member for sliding movement in a direction transverse to the direction of sliding movement of said closure member, said lock body means including a lock bolt member extending therefrom in a direction generally parallel to the direction of sliding movement of said lock body means; and

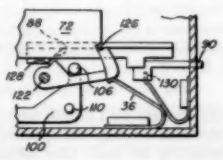
an elongated latch element pivotably attached to and received in said lock body means for rotation about a pivot axis oriented to extend transversely with respect to the direction of travel of said lock body means, said latch element having first and second ends, said first end including a detent for engaging fixed structure of the closure member so as to latch said drop lock in a locked position wherein said lock bolt member protrudes into a cooperable receiving aperture formed in said fixed frame structure to thereby secure said closure member against sliding movement, said second end of said latch element being manually actuatable to pivot said latch element about its pivot axis and thereby release said latch element from locking engagement with said closure member, and bias spring means coupled to said latch element for urging said first end away from said closure member about said pivot axis so as to maintain said latch element in locking engagement with the said latch element in said locked position.

4,428,606

LATCHSET AND STRIKE ASSEMBLY FOR DOORS

Charles L. Proffer, P.O. Box 206, Gulfport, Miss. 39501

Filed Jul. 6, 1981, Ser. No. 280,840
Int. Cl.³ E05C *1/02*
U.S. Cl. 292—181 **5 Claims**



5. A lock for latching a door, comprising in combination: a

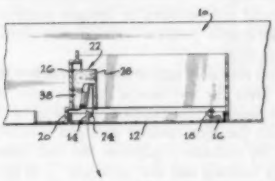
casing, a latch bolt shiftably supported from the casing for movement between projected and retracted positions relative to said casing, force means operatively connected between said casing and the latch bolt yieldingly biasing the latter toward the retracted position, a strike for mounting stationarily relative to a frame member toward and away from a closed position adjacent said strike said casing may be moved when door mounted, a bolt operator shiftably supported from said casing for shifting between first and second positions relative to said casing, said bolt operator and bolt including coacting portions operative to positively shift said bolt toward said projected position responsive to movement of said operator to said first position and to allow retraction of said bolt toward said retracted position responsive to movement of said operator to said second position, said strike and bolt operator including coacting portions operative to shift said operator toward said first position responsive to final movement of said casing toward said closed position, releasable gate means shiftably supported from said casing for movement between applied and release positions, and means operatively connected between said gate means and casing for releasably shifting said gate means to said applied position responsive to movement of said bolt to said projected postion, said gate means when in said applied position being operative to prevent movement of said bolt from said projected position toward said retracted position, said bolt operator including first and second relatively shiftable components and coacting portions establishing a one-way connection between said first and second components, said first component being engageable with said strike and said second component being engaged with said bolt, means yieldingly biasing said first component to the ready position assumed when said bolt is in said retracted position, said first component and gate means including means operative to shift said gate means from said applied position to said release position responsive to movement of said first component to said ready position.

4,428,607

LATCHING ASSEMBLY

Harold H. Levine, Northridge, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 24, 1980, Ser. No. 220,088
Int. Cl.³ E05B *47/00*
U.S. Cl. 292—201 **16 Claims**



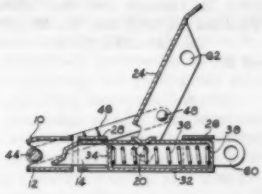
1. A latching assembly comprising:
a first latch member movable from an engaged position to a disengaged position;
a second latch member adapted to be mechanically engageable with said first latching member when said first latch member is in said engaged position;
a magnetic pole subassembly;
a magnetic armature subassembly, said magnetic armature subassembly being moveable relative to said magnetic pole subassembly and relative to said latch member from a first position wherein said armature subassembly completes a magnetic circuit across said magnetic pole subassembly to a second position wherein said magnetic armature subassembly is in contact with said first latch member;
biasing means for providing a bias force to said magnetic armature subassembly tending to cause said armature subassembly to move away from said magnetic pole subassembly and into contact with said first latch member and thereby to cause said first latch member to be moved to said disengaged position;
permanent magnetic means for applying an attractive magnetic force between said armature subassembly and said pole subassembly sufficient to overcome said bias force when said magnetic armature subassembly is in said first position in contact with said magnetic pole subassembly and said magnetic circuit is thereby completed; and
electromagnetic means associated with said magnetic circuit and responsive to the application of an electrical voltage for reducing said magnetic attraction between said armature subassembly and said pole subassembly to the point where said biasing means will cause said armature subassembly to move into contact with said first latch member whereupon it will cause said first latch member to move to its said disengaged position wherein it will be disengaged from said second latch member.

4,428,608

TOGGLE FASTENERS

Robert S. Cooke, and Howard R. S. Cooke, both of 366 Station Rd., Dorridge, Solihull, West Midlands, England

Filed Aug. 3, 1981, Ser. No. 289,316
Claims priority, application United Kingdom, Aug. 26, 1980, 8027625
Int. Cl.³ E05C *5/00, 19/14*
U.S. Cl. 292—247 **3 Claims**



1. A toggle fastener comprising first and second parts in which the first is a keeper having a cavity, and the second part has a bolt slidable therein having a nose adapted to be received in said cavity, and also having hinged thereto a lever on which is pivoted a hasp, wherein the improvement comprises (a) an opening in the keeper through which the nose of the bolt is adapted to protrude, (b) a cam surface on the nose of the bolt which is inclined to the axis of the bolt and (c) a cam surface on the keeper which is adjacent to said opening and which is opposed to and is inclined oppositely to the cam surface on the nose of the bolt, (d) said hasp being engageable with both of said cam surfaces in order to cam the keeper and the bolt in opposite directions to prevent rattling.

4,428,609

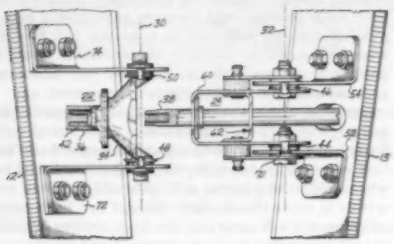
LATCH FOR FLEXIBLY JOINING TRAILING EDGE ACCESS DOORS ON AN AIRCRAFT ENGINE SUPPORT PYLON

Theodore C. Baehr, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 15, 1980, Ser. No. 187,385
Int. Cl.³ E05C *5/04*
U.S. Cl. 292—251 **1 Claim**

1. A self-aligning latch assembly comprising:
a first pair of angle mounting brackets for pivotally supporting a pin support casting for housing a clamping pin, said pin support member having a pair of trunnions at one end thereof and a flared portion at the other end thereof for contacting a funnel-shaped member to provide self-alignment of said latch assembly;
a second pair of angle mounting brackets for pivotally supporting a funnel-shaped casting having a locking recepta-

cle at the closed end of said funnel-shaped member for engagement of said clamping pin; and



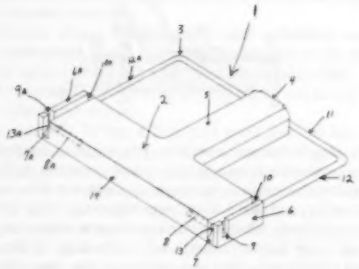
centering springs coupled to said first and second pairs of angle mounting brackets for providing the self-aligning latching function.

4,428,610

METHOD AND COLLAPSABLE FRAME FOR COLLECTING AND DISPOSING OF ANIMAL EXCREMENT

Robert W. Guffey, 266 Fairmont Ave., San Carlos, Calif. 94070

Filed Jul. 26, 1982, Ser. No. 401,629
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 B **2 Claims**



1. A pocket-sized collapsable frame comprising:

a T shaped handle dimensioned to fit within a clothing pocket wherein the central leg of the T forms a grasping means for grasping the frame during use, and the cross bar portion of the T shaped handle being at least as long as the central leg;

a rectangular wire hoop having two side portions and a cross member portion joining the two side portions, each of said two side portions being rotatably affixed to opposite ends of the cross bar portion of the T shaped handle;

said rectangular wire hoop being stowable with the plane defined by its two side portions and its cross member portion in generally the same plan defined by the T shaped handle with the cross member portion thereof adjacent the free end of the central leg of the T shaped handle; and

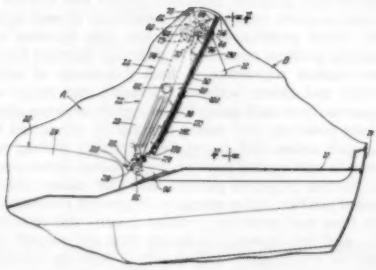
said rectangular hoop being deployable with the cross member portion being forward of, below, and substantially parallel to the maximum axis of the cross bar of the T shaped handle when the handle is held parallel to the ground for receiving a flexible container within the opening formed by the rectangular hoop and the cross bar portion of the T shaped handle.

4,428,611

ROTATING AND FOLDING REAR SEAT BACK MECHANISM

Paul Widmer, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1982, Ser. No. 394,630
Int. Cl.³ B60N *1/10*
U.S. Cl. 296—66 **5 Claims**



1. In combination with a vehicle having body support structure,

a seat assembly supported by said body support structure and including a generally horizontal seat cushion unit and a back rest unit which is adapted to be moved from a generally upright position to a generally horizontal position located rearwardly of the seat cushion unit to provide a cargo platform,

said back rest unit comprising a pair of laterally spaced hinge arms pivotally supported for movement about a generally horizontal axis between an upright position and a generally horizontal position located rearwardly of the seat cushion unit,

a back rest rotatably supported intermediate its ends by said hinge arms for movement about a generally horizontal axis between a first position in which its cushion side is adjacent the seat cushion unit and a second position in which its backside is adjacent the seat cushion unit, and

means for holding said seat back unit in its upright position, allowing said back rest to be rotated from its first position toward its second position and allowing said back rest and hinge arms to be pivoted from an upright position toward said generally horizontal position, the improvement being that

said last mentioned means comprises a latch mechanism having a three position lever means which is operable when in its first position to hold the hinge arms in their upright position and the back rest unit in its first position, which is operable when moved to its second position to release the back rest for manual movement from its first position to its second position while retaining said hinge arms in their upright position, and which is operable when in its third position to allow the hinge arms and back rest to be moved in unison from an upright position to said generally horizontal position rearwardly of the seat cushion unit whereby said backside of said seat back rest provides a cargo platform.

4,428,612

SWIVEL MOUNT FOR A VEHICLE SUN-VISOR

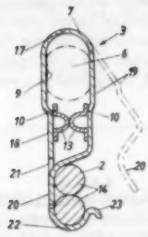
Lothar Viertel, Saarlouis, Fed. Rep. of Germany, and Alan Wrintmore, Creutzwald, France, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jan. 28, 1982, Ser. No. 343,393

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103738

Int. Cl.³ B60J 3/02

U.S. Cl. 296—97 K 13 Claims



1. A swivel mount for the sun visor of an automotive vehicle, comprising:

a mount housing for being clamped to a mounting shaft for the sun visor on the vehicle; the housing comprising a first part for engaging the mounting shaft and a second part extending away from the first part and away from the mounting shaft to an edge of the mount housing remote from the mounting shaft;

a cutout defined in the housing at a place along the shaft; the cutout extending from the first part of the housing toward the remote edge of the housing; the cutout being for receiving a detent spring;

a cutout web defined in the second part of the mount housing and extending across the cutout, and being positioned to divide the cutout into an upper cutout, which has an open edge at the first part of the mount housing and a lower cutout to the other side of the cutout web and extending toward the remote edge of the mount housing; an end stop spaced from the cutout web in the cutout and located nearer to the remote edge of the housing than the cutout web; the cutout web having a first outwardly facing side at one side of the mount housing and a second outwardly facing side at the opposite side of the mount housing;

a detent spring positioned at the cutout; the spring having a spring web which is wrapped around the mounting shaft for radially clamping to the mounting shaft; the spring including two arms, which extend away from the spring web in generally the same direction, whereby the spring is generally U-shaped;

one spring arm extending from the spring web around the mounting shaft past the first outwardly facing side of the cutout web at one side of the mount housing and past a first outwardly facing side of the end stop at the one side of the mount housing;

the other arm of the spring extending from the spring web past the outwardly facing second side of the cutout web at the opposite side of the mount housing, across the lower cutout and also alongside and in contact with the first outwardly facing side of the end stop.

4,428,613

PARKING BRAKE CABLE OF AUTOMOBILE

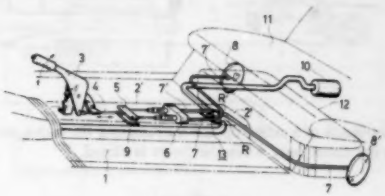
Yoshihisa Nomura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 24, 1981, Ser. No. 277,007

Claims priority, application Japan, Aug. 8, 1980, 55-111665[U]

Int. Cl.³ B62D 27/00

U.S. Cl. 296—208 4 Claims



4. In a parking brake system of an automotive vehicle having first and second parking brake cables each connected at one end thereof to an equalizer which in turn is connected to a parking brake lever, and the other end of each of said cables extends rearwardly through a floor tunnel and curves laterally at the outlet of said floor tunnel so as to be connected to respective rear wheel brakes,

a first substantially horizontally extending cable guiding pipe for supporting and guiding said first cable,

a second substantially horizontally extending cable guiding pipe for supporting and guiding said second cable, said second pipe being below said first pipe,

said first pipe being arcuate over approximately 90° and extends from one forward end which extends substantially parallel to the vehicle axis, and then curves inwardly in a direction toward said second pipe so as to cross over said second pipe and terminates at its rear end which extends in a direction transverse to the vehicle axis; and

said second pipe being arcuate over approximately 90° and extends from one forward end which extends substantially parallel to the vehicle axis, and then curves inwardly in a direction toward said first pipe so as to cross below said first pipe and terminates at its rear end which extends in a direction transverse to the vehicle axis.

4,428,614

VEHICLE ROOF WITH A ROOF OPENING CLOSABLE BY A COVER

Wolfgang Vogel, Stockdorf-Gauting; Alfons Lutz, Emmering; Richard Igel, Germering, and August Hirschberger, Munich, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH and Co., Munich, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,184

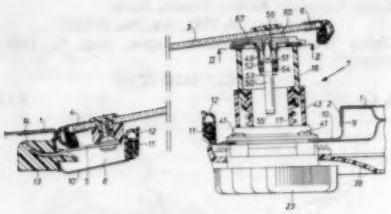
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928994

Int. Cl.³ B60J 7/08

U.S. Cl. 296—224 14 Claims

1. Vehicle roof with a roof opening and removable cover for closing said opening, said cover being attachable to a roof frame in the vicinity of its forward edge by means of a releasable swivel connection about an axis running at right angles to a lengthwise axis of the vehicle roof, and said cover having its rear edge pivotable out of the roof plane upward and outward,

by means of a tilting device disposed between the roof frame and the cover and releasable from the cover, characterized by



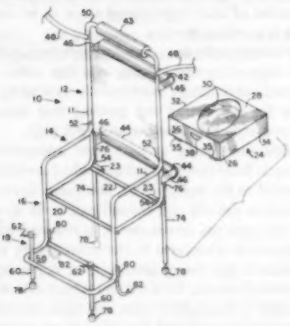
the provision of a safety device for releasing the tilting device from the cover only when the cover is closed.

4,428,615

CHAIR FOR IMMOBILE PATIENTS

Charles G. Hynson, 1995 Deborah Ave. NW., Largo, Fla. 33540

Filed Dec. 3, 1981, Ser. No. 326,660
Int. Cl.³ A47C *13/00*; A47K *11/06*
U.S. Cl. 297—118 4 Claims



1. A chair for immobile or substantially immobile patients, of the type having an elongate, vertically disposed back portion, a horizontally disposed seat portion formed integrally therewith, a vertically disposed leg rest portion formed integrally therewith, a horizontally disposed foot rest portion formed integrally therewith, and a pair of upstanding forward leg members operatively connected to said foot rest portion, wherein the improvement comprises:

a pair of upstanding, detachably mounted auxiliary leg members disposed rearwardly of said forward leg members, said chair being used as a seat when disposed in an upright position on the edge of a bed and being used as a wheel chair when said auxiliary legs have been attached thereto,

a first coupling means comprising upstanding first and second sleeve members disposed rearwardly of said forward leg members, each sleeve member adapted to telescopically receive an associated one of said auxiliary leg members,

a pair of vertically spaced, rotatably mounted roller members disposed rearwardly of the back portion of said chair,

a continuous belt member disposed in interconnecting relation around said roller members so that said chair, when in its reclining position can be moved relative to a bed surface, by engagement of said roller members and said belt member on the bed surface,

a forward cross bar member transversely disposed in interconnecting relation between transversely spaced portions of said chair that at least in part define the seat portion of said chair,

a rearward cross bar member spaced rearwardly of the forward cross bar member, and transversely disposed in interconnecting relation between said transversely spaced portions of said chair,

a second coupling means disposed adjacent said rearward crossbar member, rearwardly thereof,

said second coupling means comprising a first and second sleeve member, both of said sleeve members telescopically receiving a respective end of said auxiliary leg members,

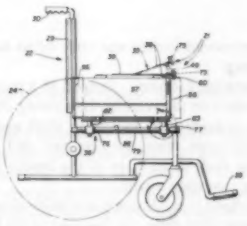
and said second coupling members aligned so that when said auxiliary leg members are releasably attached thereto, said auxiliary leg members extend laterally relative to said chair, from the lowermost surface thereof, thereby stabilizing the chair when it is in its upright configuration on the edge of a bed, being used as a seat.

4,428,616

DESK ASSEMBLY FOR A WHEELCHAIR OR THE LIKE

Rex Hamilton, 944 S. Court St., Visalia, Calif. 93277

Continuation of Ser. No. 86,689, Oct. 22, 1979. This application Nov. 4, 1981, Ser. No. 318,002
Int. Cl.³ A47B *83/02*
U.S. Cl. 297—145 8 Claims



1. A desk assembly for mounting to a wheelchair or the like having a seat and an armrest structure extending along a first side thereof, said desk assembly including desk top means, mounting means formed to mount said desk top means to said wheelchair proximate a second side thereof, and pivot means coupling said desk top means to the remainder of said desk assembly and formed for movement of said desk top means to and from a deployed position extending across and above said seat and a stored position proximate said second side of said wheelchair, wherein the improvement in said desk assembly is comprised of:

said desk top means is provided by two desk top members each formed to extend across and above said seat in said deployed position, and hinge means coupling said desk top members together for pivotal movement to a folded position about a horizontal axis extending across said seat when said desk surface means is in said deployed position;

said pivot means being secured to a forwardmost of said desk top members and being formed for movement of said desk top means after folding to said folded position by pivoting about two mutually perpendicular axes to a stored position in which the folded desk top means is positioned to extend along said second side of said wheelchair to substantially the same extent as said armrest structure extends along said first side of said wheelchair; and

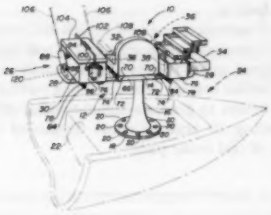
said desk top means being formed to fold to an overall size and configuration in said stored position substantially the same as the size and configuration of said armrest structure.

4,428,617

BOAT SEAT FISHING ACCESSORY-ARM REST SUPPORT ASSEMBLY

Jack O. Lawson, R.D. #4, Ephrata, Pa. 17522

Filed Sep. 8, 1981, Ser. No. 300,382
Int. Cl.³ A47C 7/62
U.S. Cl. 297—188 36 Claims



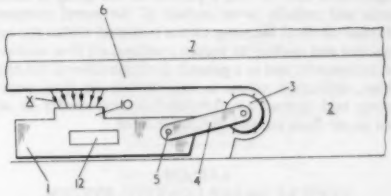
1. A boat seat fishing accessory support assembly for a fishing boat having a boat seat provided with a boat deck-mounted pedestal upward swivelly supporting a seat connecting spider centrally intermediate thereof in turn receivably upward communicating disconnectably through a plurality of geometrically configured spider lobe openings individually a respectively corresponding plurality of bolts insertably through a respectively corresponding plurality of geometrically configured openings in a first upward disposed planar seat bottom of said boat seat to a second upward disposed planar seat cushion of said boat seat said seat cushion provided recessively within the underside planar surface thereof with a respectively corresponding plurality of geometrically configured threaded sockets individually adapted to receive by threadably inserted and compressively drawn communication therewithin said plurality of bolts, in combination with an attachment plate having a spaced set of downwardly disposed elongated tubular members integral thereto two opposing sides thereof and spatially adapted to communicably receive downwardly disposed therebetween said first upward disposed planar seat bottom when oriented such that said tubular members respectively parallelly align one said opposing side thereof with a forward edge of said boat seat and the other said opposing side thereof with a rearward edge of said boat seat and further adapted by means of a plurality of geometrically configured openings therein provided to insertably communicate individually therethrough said respectively corresponding plurality of bolts for threadably engaged and compressively drawn communication with said second upward disposed planar seat cushion recessively underside said planar surface disposed respectively corresponding plurality of geometrically configured threaded sockets such that said attachment plate is compressively secured in interposed disposition between said first upward disposed planar seat bottom and said second upward disposed planar seat cushion of said boat seat, a set of elongated leg U-shaped tubular members adapted for insertably disposed extensibly adjusted supportable retention within said spaced set of downwardly disposed elongated tubular members in bilateral disposition relative to said forward edge and said rearward edge of said boat seat, retention means to lockably engage said set of elongated leg U-shaped tubular members at an extensively adjusted disposition respectively end inward along the elongated leg portions thereof within said elongated tubular members, and clamp means adapted to detachably affix in upward supportable disposition to said set of elongated leg U-shaped tubular members either bilateral side of said boat seat a right bilaterally connected container and a left bilaterally connected container.

4,428,618

MINING MACHINE CONTROL SIGNAL PROCESSING SYSTEM

Graham J. Fecitt, Bury, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 29, 1981, Ser. No. 306,715
Claims priority, application United Kingdom, Oct. 28, 1980, 8034685
Int. Cl.³ E21C 35/08, 27/24
U.S. Cl. 299—1 10 Claims



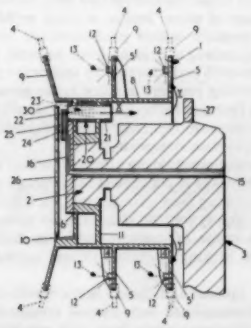
1. A signal processing system for a mining machine having a cutter for excavating rock or mineral from a working face to form a cut boundary profile, steering means for controlling the cutting horizon of the cutter, and a sensor for sensing a preselected parameter associated with the cutting horizon of the cutter and for deriving a sensor signal dependent upon the sensed cut boundary profile, the system comprising a processing means for receiving and processing the sensor signal to derive an operational signal indicative of the cutting horizon of the cutter, calibration means having manually activated input means for feeding in a calibration signal representative of a known existing condition of the cutting horizon of the cutter, and comparator means for comparing the derived operational signal with the calibration signal to determine any error in the derived operational signal and for instructing the processing means to apply a suitable correction to the derived operational signal should any error be determined.

4,428,619

ROTARY CUTTER HEADS FOR MINING MACHINES

Brian A. Eagles, and Jonathan S. Kelly, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 14, 1980, Ser. No. 196,742
Claims priority, application United Kingdom, Nov. 16, 1979, 7939749
Int. Cl.³ E21C 35/22
U.S. Cl. 299—81 8 Claims



1. A rotary cutter head for a mining machine having a drive component for drivable engagement by the cutter head, com-

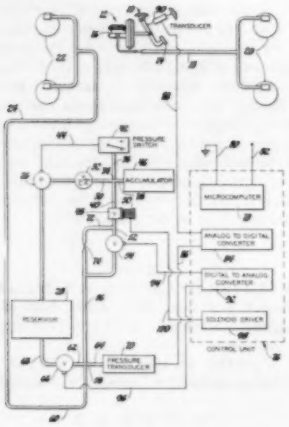
prising a hub assembly adapted to be drivably engageable with the drive component, a cylindrical barrel component secured around the hub assembly and defining a radially outer surface, at least one cut material loading vane mounted on said radially outer surface defined by the barrel component, a plurality of cutter tool holders mounted around the loading vane, and air flowing inducing means, which in use, when the cutter head is mounted on the mining machine tend to induce an air flow outside the barrel component and in a general direction away from the mining machine, the air flow inducing means comprising a number of air flow inducing sprays, each spray being arranged such that, in use, a portion of the spray is directed towards said radially outer surface of the barrel component and further air flow inducing means mounted within the barrel component and tending to induce a second air flow within the barrel component and in a general direction toward the mining machine, deflection means in said second air flow path for directing said second air flow radially outwardly so as to induce an air flow around the cutter head.

4,428,620

VEHICLE BRAKE CONTROL SYSTEM

Edward H. Warwick, Englewood, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1982, Ser. No. 362,405
Int. Cl.³ B60T *13/74*
U.S. Cl. 303—3 **2 Claims**



1. A vehicle brake control system for a vehicle having first and second sets of wheel brakes, a brake pedal actuatable by the vehicle operator within predetermined force and travel ranges corresponding to braking force demand, a master cylinder connected with and operable by said brake pedal to generate brake actuating pressure in a first brake pressurizing circuit in which said first set of wheel brakes is connected for pressure operation by pressure from said master cylinder, said vehicle brake control system comprising:

a second brake pressurizing circuit in which said second set of wheel brakes is connected for pressure operation;

means generating and maintaining and storing a braking pressure supply for said second brake pressurizing circuit within a range of pressure sufficient and desirable for maximum braking operation of said second set of wheel brakes;

selectively opened and closed first control means to selectively communicate and prevent communication of the braking pressure supply from said generating and maintaining and storing means to said second brake pressurizing circuit;

second control means in said second brake pressurizing circuit variably controlling the brake pressure supply from said first control means to said second set of wheel brakes;

a first transducer responsive to actuation of said brake pedal to generate a braking effort demand signal for said second set of wheel brakes;

a second transducer responsive to brake actuating pressure being actually delivered to said second set of wheel brakes through said second brake pressurizing circuit to generate a signal reflecting actual braking effort at said second set of wheel brakes;

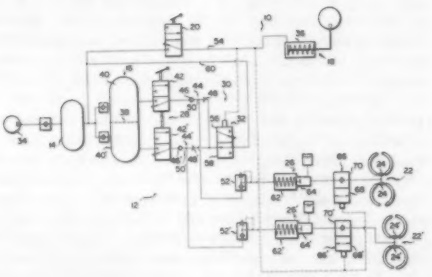
and a control unit receiving said signals and acting to open said first control means upon receipt of said braking effort demand signal and to variably control said second control means to permit braking pressure acting on said second set of wheel brakes to generate actual braking effort thereat corresponding to braking effort demanded thereof by actuation of said brake pedal.

4,428,621

COMBINED PARKING AND SERVICE BRAKE SYSTEM

Hiroyuki Taki, Komatsu; Hidenori Mizuguchi, Kanazawa, and Hiroshi Ota, Komatsu, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,766
Int. Cl.³ B60T *11/18*
U.S. Cl. 303—13 **9 Claims**



1. A combined parking and service brake system capable of positively holding a stopped vehicle in a stationary position, comprising:

(a) first and second sources of fluid under pressure;

(b) fluid-actuated parking brake means;

(c) a parking control valve for controlling fluid communication between the first pressurized fluid source and the parking brake means, the parking brake means being applied and released by the parking control valve;

(d) fluid-actuated service brake means;

(e) service brake control valve means for applying and releasing the service brake means by controlling fluid communication thereof with the second pressurized fluid source; and

(f) source selector means for normally allowing communication between the service brake control valve means and the service brake means, the source selector means being responsive to the actuation of the parking control valve for placing the first pressurized fluid source in communication with the service brake means upon application of the parking brake means;

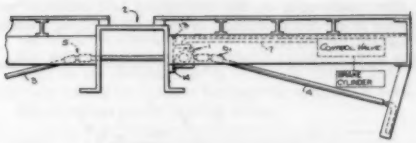
(g) whereby both the parking brake means and the service brake means are applied upon actuation of the parking control valve.

4,428,622

RAILWAY VEHICLE BRAKE SYSTEM WITH FOUR-WAY VALVE

Robert G. Beacon, Sparta, N.J., assignor to Elicon-National, Inc., Totowa, N.J.

Filed Aug. 25, 1981, Ser. No. 296,140
Int. Cl.³ B60T *17/04*
U.S. Cl. 303—84 R 13 Claims



1. In a brake system for a railroad vehicle having a brake cylinder, a fluid operable control valve for controlling the fluid supplied to said cylinder, said valve having a controlling fluid input opening, and a brake pipe having two sections, a manually operable valve connected to said opening in said control valve and to said sections of said brake pipe for alternatively connecting, for fluid flow therebetween, said sections and said opening, one of said sections and said opening, the other of said sections and said opening and said sections only, said manually operable valve comprising:

a housing having three openings extending from the interior of said housing to the exterior thereof, two of said openings being co-axial and the third of said openings having its axis extending perpendicularly to the axis of said two openings;

means connecting each of said two openings respectively to a section of said brake pipe;

means connecting said third opening to said opening in said control valve;

a valve operating member rotatably mounted in said housing, said member having a central portion having a first channel extending therethrough, said member being rotatable into a position in which said first channel is aligned with said two openings and into other positions in which said first channel has one end at said third opening and said central portion also having a second channel therein extending from the exterior of said central portion to said first channel, said member being rotatable into positions in which said second channel has one end at one of said three openings in said housing, said member also having a pair of operating shafts integral with said central portion and respectively extending in opposite directions from said central portion and outwardly of said housing; and

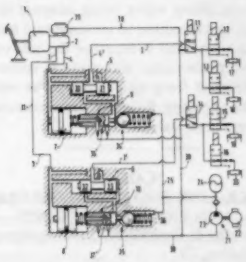
sealing means in each of said three openings for providing a fluid seal between said housing and said central portion of said valve operating member, each of said sealing means comprising a hollow cylinder mounted in the corresponding opening with the axis thereof aligned with the opening, said hollow cylinder having a portion thereof forming at least one wall of an annular channel between said cylinder and the wall of the corresponding opening and said channel opening toward said central portion of said valve operating member, a sealing ring slidably mounted in said channel and engaging said central portion and a resilient, compressed ring mounted in said channel between said sealing ring and said hollow cylinder and acting between said hollow cylinder and said sealing ring to urge the latter against said central portion of said valve operating member and thereby provide a seal around the end of the channel in said central portion adjacent to the hollow cylinder.

4,428,623

BRAKE FORCE AMPLIFIER FOR A MULTIPLE CIRCUIT BRAKE SYSTEM

Hannes Bertling, Vaihingen, and Heinz Leiber, Leimen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,127
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024184
Int. Cl.³ B60T *13/14*
U.S. Cl. 303—114 5 Claims



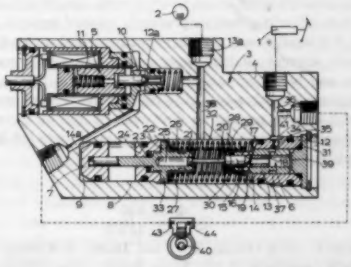
1. A brake force amplifier for a multiple-circuit brake system for motor vehicles, including a main cylinder, a multiple-circuit brake valve actuatable by fluid pressure from said main cylinder, said valve further arranged to effect an amplification in brake circuits which is proportional to the main cylinder pressure, a pressurizing system substantially comprising a pump and a reservoir for supplying fluid under pressure to said main cylinder, a switching valve provided in parallel to the multiple-circuit brake valve, said switching valve being actuatable by the main cylinder pressure and arranged to maintain said multiple-circuit brake valve ineffective if the pressurizing system has no pressure available for said system, a travel simulator subjected to fluid pressure in at least one pressure line leading from said main cylinder to said multiple-circuit brake valve and said travel simulator is provided with a travel limiting spring valve.

4,428,624

ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 7, 1982, Ser. No. 337,757
Claims priority, application United Kingdom, Jan. 14, 1981, 8101108; May 12, 1981, 8114404
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—116 14 Claims



1. An anti-skid braking system for a vehicle braking system comprising a wheel, an hydraulic brake for braking said wheel, a supply of brake-applying fluid for supplying fluid under

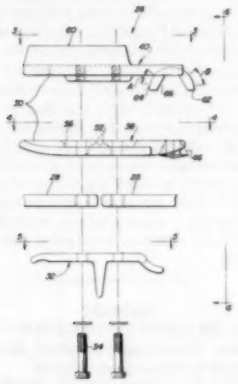
pressure to said brake to apply said brake, means to sense the presence of skid conditions at said wheel during braking and thereupon to produce a skid signal, a dump valve operative to cause fluid to be displaced from said brake in response to a skid signal from said means so as to relieve the pressure of fluid supplied to said brake, a flow-control regulator valve arranged to regulate flow of fluid to said brake so as to re-apply said brake pressure at a controlled rate, a valve spring for biassing said flow-control valve, an expander piston for regulating the biassing effect of said valve spring and responsive to fluid exhausted by said dump valve in response to a skid signal, fluid exhausted by said dump valve being adapted to displace said expander piston in a direction to increase said biassing effect to said valve spring whereby to increase the rate of flow of fluid through said regulator valve, and a power source operative to cause fluid displaced from said brake to be returned to said supply of brake-applying fluid on the upstream side of said flow-control regulator valve.

4,428,625

DRIVE TRACK LINK INCLUDING SEPARABLE WEAR AND BASE COMPONENTS

William P. Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 1, 1982, Ser. No. 344,668
Int. Cl.³ B62D *55/24, 55/26*
U.S. Cl. 305—12 **19 Claims**



1. A track link, adapted for use in a track section of a drive track for a track laying vehicle, comprising: a wear component having right- and left-hand transversely spaced, longitudinally extending wear member portions; a base component having right- and left-hand transversely spaced, longitudinally extending base plate portions respectively located beneath the right- and left-hand wear member portions and extending transversely therebeyond; fastener means releasably securing said wear and base components together; and at least a part of a transverse sprocket-engaging portion forming an integral part of and joining respective first ends of one of the right- and left-hand base plate portions and the right- and left-hand wear member portions.

4,428,626

STABILIZER

Harlan E. Blau, Odessa, Tex., and Jimmy D. Elmore, Ardmore, Okla., assignors to GH Texas Reamer, Inc., Odessa, Tex.

Filed Oct. 13, 1982, Ser. No. 434,060
Int. Cl.³ E21B *17/10*
U.S. Cl. 308—4 A **12 Claims**

1. An apparatus comprising,

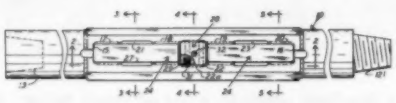
an elongate tubular body having a flowway therethrough and threads on each end for making up in a drill string,

said body having a plurality of circumferentially arranged elongate slots extending generally longitudinally of the body and closed on at least one end,

each slot having at least two alternate undercut and two non-undercut sections in the side walls of said slot with one undercut section adjacent the closed end of said slot,

at least one unitary wall engaging member mounted in said slot and having alternate latch sections on its opposite sides conforming to and confronting said undercut sections to prevent movement of said wall engaging member radially of said body,

said wall engaging member having a reduced width release



section alternating with said alternate latch sections and having a width dimension less than the width of said slot at an undercut section permitting the wall engaging member to move radially of the slot when the reduced width section is aligned with an undercut section,

a retainer block, and

means releasably securing the retainer block to the body at one of said non-undercut slot sections to position the wall engaging member between a closed end of a slot and the retainer block with the undercut slot section and the latch section of the wall engaging member confronting each other to retain the wall engaging member in the slot,

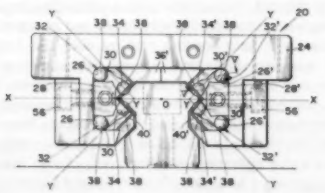
said releasable means permitting movement of the block longitudinally of the body while preventing radial movement of the block relative to the body.

4,428,627

RECIRCULATING-BALL LINEAR BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,267
Claims priority, application Japan, Mar. 6, 1982, 57-35432
Int. Cl.³ F16C *29/04*
U.S. Cl. 308—6 C **11 Claims**



1. A recirculating-ball linear bearing capable of withstanding the load acting thereon in four orthogonal directions, comprising:

(a) a bearing body of substantially inverted-U-shaped cross section having two pairs of channels of arcuate cross section formed longitudinally on inner surfaces thereof;

(b) a pair of bearing races rigidly mounted to the inner surfaces of the bearing body in opposed relation to each other, each bearing race having a pair of channels of arcuate cross section formed longitudinally thereon in opposed relation to one pair of channels on the bearing body, the pair of channels on each bearing race and the corresponding pair of channels on the bearing body defin-

ing in combination a pair of return passageways of substantially circular cross section, each bearing race also having a pair of raceways of arcuate cross section formed longitudinally thereon in opoosed relation to a like pair of raceways on the other bearing race;

(c) a pair of end covers secured to the opposite ends of the bearing body and the bearing races, each end cover having formed therein hairpin grooves each intercommunicating one raceway on one bearing race and the adjacent one of the return passageways defined between the bearing body and the bearing races;

(d) groups of recirculating antifriction balls capable of rolling along the respective raceways and through the respective return passageways separately communicated therewith via the hairpin grooves in the end covers; and

(e) cage means for rollably holding the antifriction balls on the raceways on the bearing races.

4,428,628

HIGH SPEED, DURABLE ROLLER BEARING

Paul F. Brown, Bolton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1981, Ser. No. 315,325
Int. Cl.³ F16C *19/00, 33/66, 33/58, 33/48*
U.S. Cl. 308—187 **3 Claims**

1. A high speed roller bearing including an outer race, an inner race consisting of two pieces having adjacent faces, a row of rollers mounted between the outer race and each inner race piece, said rollers having a length-to-diameter (L/D) ratio of less than 0.866 and having parallel rotational axes, the adjacent faces of each inner race piece having a recess defining together a circumferential groove and the opposite face of each inner case piece having a flange to guide and retain said rollers, a retainer cage located between the rows of rollers and guided by said cicumferential groove, and means in said inner race pieces for supplying cooling and lubricating oil to said rollers and said cage.

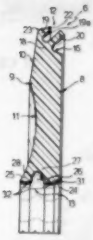
4,428,629

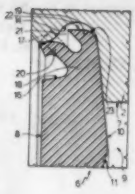
PROTECTION AND SEAL MEMBER FOR ROLLING BEARINGS

Franco Colanzi, and Angelo Vignotto, both of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Nov. 27, 1981, Ser. No. 325,193
Claims priority, application Italy, Dec. 2, 1980, 68837 A/80
Int. Cl.³ F16C *33/78, 33/80*
U.S. Cl. 308—187.2 **8 Claims**

1. A protection member (6) for a rolling bearing (1), arranged to be interposed between the outer race (2) and the inner race (3) of the bearing in order to isolate relative to the outer ambient the cavity formed between the said races, the outer race being provided with an annular seating (14) arranged to accomodate therein the peripherally outer portion (12) of the said member (6), characterized in being configured like a ring and made of a resilient and deformable material, the inner edge (13) of the said member (6) being arranged to cooperate with the outer surface (15) of the said inner race (3) in order to provide a seal between the said cavity and and the outer ambient, and the outer edge (12) of the said member (6) being provided with at least two annular lips (19,20) arranged to provide a snap-coupling with an annular groove (21) formed in the said seating (14) in order to prevent the said member (6) from being displaced axially relative to the outer race (2) and provide a seal between the said cavity and the outer ambient; characterized in that the said outer edge (12) of the said member (6) comprises a first annular lip (19) arranged to be ac-





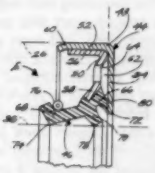
comodated in the said annular groove (21) and having an outer diameter substantially equal to that of the said annular groove (21) in order to fit into it, and a second lip (20) arranged to rest with a pre-established pressure in the said seating (14) and having an outer diameter larger than that of the said seating in order to be deformed by this latter.

4,428,630

SEALED BEARING AND SELF-VENTING SEAL THEREFOR

Russell F. Folger, North Canton, and Henry J. Wasik, Massillon, both of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Jul. 2, 1982, Ser. No. 394,867
Int. Cl.³ F16C *33/76;* **F16J** *15/32*
U.S. Cl. 308—187.2 **23 Claims**



1. A seal for isolating a region within a hollow member in which an interior member is disposed such that relative rotation between the two members is possible, said seal comprising: a generally rigid seal case configured to be secured to the hollow member, the case having an inner wall that is presented toward the isolated region and an annular outer wall that is presented away from the isolated region, the two walls being fixed in position with respect to each other and further being spaced apart to create an annular chamber between the walls, with the chamber being in communication with the isolated region; a first elastomeric seal lip of annular configuration mounted on the case and being adapted to contact the interior member, so as to form a barrier along the interior member notwithstanding relative rotation between the two members; and a second elastomeric seal lip of annular configuration mounted on one of the seal case walls and extended to the other of the seal case walls which it normally contacts along a generally circular area that is generally concentric with respect to the first seal lip so as to close the chamber between the two walls, the second seal lip being capable of flexing away from the other seal case wall in response to an increase in pressure within the chamber and the region isolated by the seal

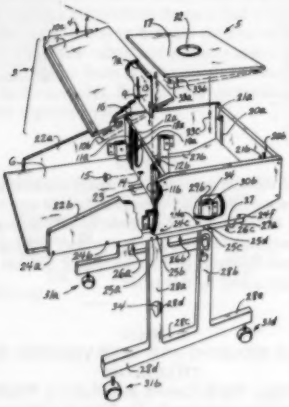
so as to prevent excessive pressure from developing within the isolated region.

4,428,631

COMPUTER KEY-PUNCH WORK-STATION HAVING ADJUSTABLE COPY SUPPORT-SHELF

Raymond Cope, and Michael King, both of Birmingham, Ala., assignors to Health Science Products, Inc., Birmingham, Ala.

Filed Dec. 7, 1981, Ser. No. 327,794
Int. Cl.³ A47B *21/00, 63/00*
U.S. Cl. 312—194 **11 Claims**



1. A computer key-punch work-station structure comprising in combination: a keyboard work shelf, two spaced-apart side panels mounted bilaterally on each of opposite edges of the keyboard work shelf, a copy support shelf, and a copy support shelf-mounting means for mounting said copy support shelf on and between said two spaced-apart side panels and elevated above said keyboard work shelf, said copy support shelf being mounted with its forward and rearward portions spaced-above said keyboard work shelf a predetermined distance sufficient for providing a storage space on a rearward portion of the keyboard work shelf below the copy support shelf, and a forward edge of the copy support shelf being spaced rearwardly of a forward edge of the keyboard work shelf a predetermined distance sufficient for resting a computer keyboard on a forward portion of the keyboard work shelf at a location not substantially beneath the copy support shelf, and height adjustment means for intermittent adjustment of a rearward portion of the copy support shelf at different heights, and a video display-screen support shelf, and video display-screen support shelf-mounting means for mounting said video display-screen support shelf in juxtaposition to and rearwardly of said copy support shelf and said keyboard work shelf, and video-shelf adjustment means for intermittent adjustment of the video display-screen support shelf at different heights, said copy support shelf being forwardly inclined.

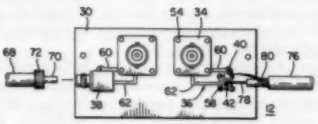
4,428,632

COAXIAL CABLE TRANSITION CONNECTOR

Donald S. Rich, Flanders, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 10, 1979, Ser. No. 65,638
Int. Cl.³ H01R *9/09, 17/12*
U.S. Cl. 339—17 C **7 Claims**

1. A transition connector for joining two different coaxial cables, each having a signal conductor and a ground conductor comprising: a substrate; at least one first connector means mounted upon said substrate for receipt of a first coaxial cable and having signal and ground contacts; at least one second connector means mounted upon said substrate for receipt of a second coaxial cable and having signal and ground contacts; and trace means upon said substrate coupled to said first connector means and said second connector means for interconnecting said first and second coaxial cables and matching the characteristic impedances thereof, said trace means including a signal trace connecting said signal contacts of said first and



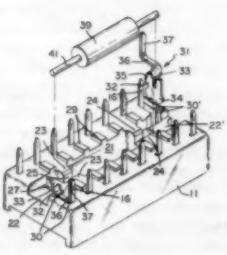
second connector means and disposed on one side of said substrate, a first ground trace disposed on the side of said substrate opposite said one side and in trace-aligned registry with said signal trace, and a second ground trace electrically connected to said first ground trace and connecting said ground contacts of said first and second connector means.

4,428,633

DUAL-IN-LINE SOCKET ASSEMBLY

Robert G. Lundergan, Camp Hill, and Richard L. Marks, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 1, 1982, Ser. No. 353,298
Int. Cl.³ H05K *1/18*
U.S. Cl. 339—17 CF **7 Claims**



1. A dual-in-line socket assembly comprising a housing moulded in one piece from insulating material with rows of aligned contact-receiving cavities and electrical contacts received in respective cavities, the contacts having receptacle portions opening to a first, plug receiving, face of the housing and tab portions projecting from a second, opposite, face of the housing, the improvement comprising first and second terminals each stamped and formed in one piece from sheet metal and comprising a component lead contacting portion and a tab portion, the terminals being anchored in the housing in spaced apart relation with the tab portions of the terminals extending closely adjacent tab portions of respective predetermined contacts to provide composite plugs whereby each terminal tab portion can be plugged into a common aperture in a printed circuit board.

4,428,634

CAP SHOES FOR CABLE CONNECTOR

Charles W. Waas, Huntington Beach, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Apr. 17, 1981, Ser. No. 255,328
Int. Cl.³ H01R *13/635*
U.S. Cl. 339—42 **8 Claims**

1. In a cap shoe for making electrical connections between a

plurality of conductors in a first cable and a corresponding plurality of conductors in a connector module of an elongate strip connector which includes an index strip, the connector module, and a cap, the cap having access holes leading to the respective conductors in the connector module, the connector module including means for terminating the ends of conductors of a second cable, the combination of:

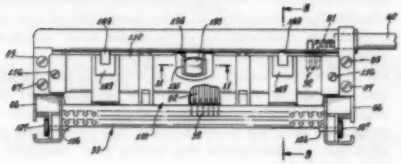
a cap shoe body of a size and shape to accommodate the connector and having an elongate central section with first and second arms projecting from opposite ends of said central section forming a first U-shaped receptacle for the connector, said cap shoe body having front and rear molded shell sections joined together at their ends,

said body shell sections including means defining first and second arm grooves between said sections at each end thereof, with said first and second arms slidably insertable into said first and second arm grooves, respectively;

connector means for holding each of said arms in the corresponding groove, whereby sets of arms of different configurations can be installed and removed as desired;

releasable means for securing said cap shoe body to the connector;

a plurality of spring loaded contact pin units carried in a line along said central section of said cap shoe body between



said front and rear sections, and having pins insertable through the respective access holes in the cap into electrical contact with the respective conductors in the connector module, each of said pin units including means for terminating the end of a conductor of the first cable, with said cap shoe body including means for receiving the first cable;

a second U-shaped slide member in the form of a unitary molding and mounted on said cap shoe body with the arms of said slide member embracing said body and slidable relative thereto between extended and retracted positions in a direction parallel to the axes of said contact pins, and including an integral elongate spacer between the arms of said slide member with openings in a line through which said contact pins extend; and

compression spring means positioned within said cap shoe body and engaging said body and slide member urging said slide member away from said body for ejecting the connector from said body;

whereby said extending contact pins enter the access holes in the cap into electrical contact with the respective conductors in the connector module upon retraction of said slide member by sliding said cap shoe body onto the connector and compressing said spring means.

4,428,635

ONE PIECE ZIF CONNECTOR

Wilbur A. Hamsher, Jr., Carlisle, and Robert N. Weber, Humelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 24, 1982, Ser. No. 351,713
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **10 Claims**

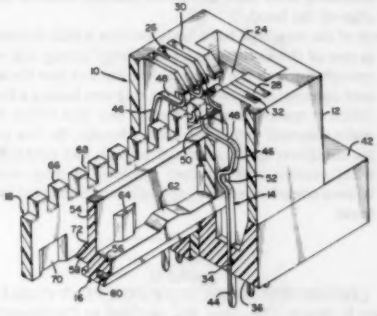
7. A zero insertion force electrical connector for connecting a daughter circuit board to a mother circuit board while providing low mating force with contact wiping action, said connector comprising:

an elongated housing of rigid insulative material defining an elongated daughter board receiving cavity therein;

a plurality of resilient electrical terminals mounted in said housing in parallel spaced relationship in at least one row along at least one side of said cavity;

an elongated cam mounted in the base of said cavity for longitudinal movement therealong; and

at least one cam follower mounted in said cavity lying between said cam and a respective row of terminals,



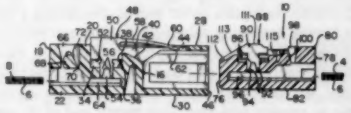
whereby upon first actuation of said cam from an initial position drives said cam follower outwardly to spread said terminals to receive said daughter circuit board therebetween, return of said cam to said initial position returns the termnals under their own spring action to come into an engaged position with said daughter circuit board, and second actuation of said cam from said initial position drives said cam follower upward parallel to the surfaces of said daughter board to provide a wiping action of said terminals across the surface of said daughter board.

4,428,636

MULTI-CONTACT CONNECTORS FOR CLOSELY SPACED CONDUCTORS

Lit-Yam Kam, Camp Hill, and Billy E. Olsson, New Cumberland, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1981, Ser. No. 318,534
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—97 P **5 Claims**



1. A multi-contact electrical connector receptacle of the type comprising a one piece insulating housing having a mating face, a rearward face, first and second oppositely directed sidewalls and oppositely directed endwalls extending between the faces, a hood extending forwardly beyond and surrounding, the mating face, the hood having a free edge which is spaced from the mating face, a plurality contact receiving cavities in the housing, the cavities being in side-by-side relationship in a row which extends between the housing endwalls, a receptacle terminal in each of the cavities, the hood being dimensioned to receive a connector plug having plug terminals therein which are mated with the receptacle terminals when the plug is inserted into the hood, the connector receptacle being characterized in that:

the receptacle terminals are flat stamped terminals having a

thickness which is equal to the thickness of the stock metal from which the terminals were stamped,

the cavities extend inwardly from the first sidewall towards the second sidewall, the cavities being spaced from the mating face and being spaced from the rearward face.

each of the cavities has an associated individual recess and an associated individual opening in the hood, the recesses extending in the one sidewall from their associated cavities to, and intersecting, the mating face, the openings extending from their associated recesses towards the free edge of the hood,

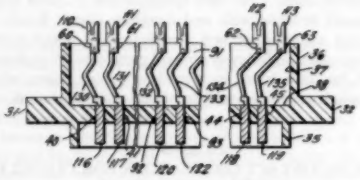
each of the terminals has a body portion which is contained in one of the cavities and a cantilever spring arm which extends through the associated recess and into the associated opening, each cantilever spring arm having a free end which is spaced from the mating face and which is normally disposed within the hood whereby the free ends of the cantilever spring arms will engage, and establish electrical contact with, contact portions of plug terminals when a complementary plug connector is inserted into the hood.

4,428,637

CONNECTOR STRUCTURE FOR FLAT CABLE

Sidney V. Worth, Flourtown, Pa., assignor to Continental-Wirt Electronics Corp., Warminster, Pa.

Filed Oct. 16, 1978, Ser. No. 951,629
Int. Cl.³ H01R *13/36*
U.S. Cl. 339—99 R **18 Claims**



1. A cable connector for flat cable; said cable connector comprising an insulation base of generally rectangular configuration and having contact piercing members extending from one surface thereof and respective contact noses extending from an opposite surface thereof, a plain cover means for covering said contact piercing member and the cable connected thereto; said plain cover means comprising a flat cover section having extending relatively flexible end sections; each of said end sections having repective first latch means; the opposing side surfaces of said base each having first and second vertically spaced cooperating cam projection means each operable to receive said first latch means and to fix said plain cover means over said base at a first and second respective height above the top surface of said base; said first latch means and first cam projection being easily disconnected whereby said plain cover means can be loosely connected to said base by latching of said first latch means and said first cam projection means, and is more closely secured to said cover means where said first latch means engages said second cam projection means;

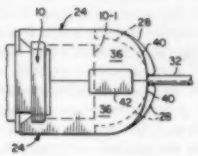
a strain relief cover, said strain relief cover having a flat section and two end sections defining a U shape, said two end sections having second latch means thereon; said plain cover means having third cam projection means extending from the outer surfaces of its said flexible end sections; said second latch means being engageable with said third cam projection means to hold said strain relief cover onto said plain cover means.

4,428,638

STRAIN RELIEF COMPONENT FOR ELECTRICAL CONNECTOR

William S. Greenwood, Nutley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 9, 1981, Ser. No. 300,463
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—107 **11 Claims**



1. For use with an electrical connector of the type receptive of flat cable having a plurality of conductors, said connector including

an elongated insulator body having a plurality of conductor receptive channels and a plurality of electrical contacts carried one each in the respective ones of said channels for electrically connecting an associated one of the cable conductors therewith, a cable strain relief component fittable to said connector and comprising

a pair of cover parts each having an elongated panel segment and embodying means for fixedly securing said panel segments to said insulator body at opposite sides of such body, said securing means holding said cover parts panel segments in disposition overlaying said channels and spaced therefrom;

resilient members carried on each of the respective cover parts and when said panel segments are fixedly secured to said insulator body extending into resiliently yieldable engagement with said cable on opposite side faces thereof at a location remote from said contacts and thereby applying at such remote location oppositely directed strain-relieving bias forces to the cable, and resilient members being substantially elongatedly coextensive with said panel segments and extending laterally relatively of said panel segments from a location of adjacency therewith in courses of convergence with and having termini at the opposite faces of said cable at said remote location;

cover part side skirts carried at opposite ends of the panel segments, the skirts of one part being alignable with those of the other part to define cover side walls othogonal to said panel segments, said side skirts of each cover part being fixed to the opposite ends of its panel segment and further extend alongside the respective opposite ends of the associated resilient member but spaced a distance therefrom; and

complementary engageable latch means carried on the cover parts for latching such parts together to define a unitary enclosure structure.

4,428,639

ELECTRICAL CONNECTOR

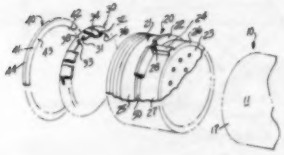
Frank M. Hillis, Franklin, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 5, 1982, Ser. No. 365,847
Int. Cl.³ H01R *13/658*
U.S. Cl. 339—143 R **6 Claims**

5. An electrical connector mating portion having a contacting element and an annular electrically conducting shell encircling said element and insulatively spaced therefrom, a continuous annular groove (**50**) disposed about said shell, a shielding ring (**60**) having a continuous band (**62**) coextensive with said groove and convexly curved spring fingers (**64**) extending forwardly therefrom, and means for mounting said shielding

ring relative to said connector mating portion, said mounting means being solderless and characterized by:

an annular compression ring (40) having inner and outer



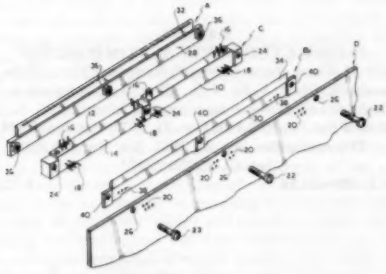
circumferential faces (42, 44) and adapted to plastically deform when forced radially inward into said groove; and means (54) coextensive with said groove (50) for deforming the annular compression ring to form a compression fit.

4,428,640

PROTECTIVE MEANS FOR MULTIPLE PIN CONNECTORS

Robert B. Pittman, River Edge, N.J., assignor to Industrial Electronic Hardware, New York, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,134
Int. Cl.³ H01R *13/516*
U.S. Cl. 339—176 M 6 Claims



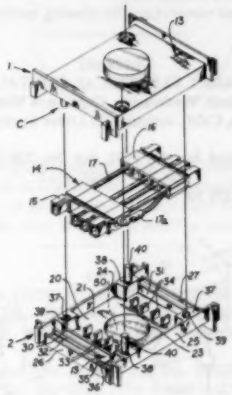
4. In combination, an electrical connector of the type having a body with first and second adjacent sides, the first side being adapted to be mounted proximate the surface of a circuit board by a mounting device extending from the board through an opening in the body and into a recess in the body aligned with the opening, the recess being adapted to receive mounting device engaging means therein, the connector body having a first set of pins extending from said first side and a second set of pins extending from the second side, the first set of pins being connectable to the circuits on the board, and the second set of pins being adapted to extend in a given direction substantially parallel to the board, and pin protection means separate from the connector body and attachable with the connector body, as a unit, to the board, the protection means comprising a mounting part and a protective part, said mounting part having means for engaging the mounting device affixed thereto and extending outwardly thereof, said connector body being adapted to be positioned between the board and said mounting part with the engaging means at least partially received in the recess in the connector body, said protective part extending beyond the edge of the connector body in a direction generally parallel to said given direction.

4,428,641

CABLE COUPLER/WIRING ADAPTOR

Charles T. Flachbarth, Parkersburg, and Richard D. Benscoter, Vienna, both of W. Va., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Dec. 7, 1982, Ser. No. 327,945
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—205 2 Claims



1. A coupler to join a pair of plug-in connectors in a wiring system comprising:

a pair of identical housing sections abutting one another, the sections forming: (a) a hollow interior; (b) two oppositely disposed cavities; (c) an internal opening between each cavity and the interior of the housing; (d) an external opening between each cavity and the exterior; and (e) a pair of external flanges respectively around said external openings;

a receptacle and wiring assembly disposed in said interior, the assembly having a pair of receptacle means and conductors connected to and extending between the receptacle means, the receptacle means having portions respectively disposed in said cavities in position for receiving plug-in connectors;

each said housing section being characterized by:

a flat, rectangular shaped plate section having an exterior surface and an interior surface;

an annular offset section in the center of the plate section and extending outwardly from the exterior surface thereof;

a pair of side walls respectively extending along two opposite edges of the plate section and outwardly from said interior surface, the respective walls of the two housing sections abutting one another to form the sides of the coupler and closing off said interior;

a pair of end walls extending between said side walls and respectively disposed along the other two opposite edges of said plate section;

each end wall extending outwardly from its opposite side walls and also extending outwardly from the exterior surface of the plate section, said end wall extensions forming part of said external flange;

each end wall extending outwardly from the interior surface of the plate section, last said end wall extensions forming part of said external openings and providing support for a plug-in connector;

a pair of interior walls extending between said side walls and disposed inwardly of said end walls, the interior walls extending outwardly from said interior surface to respectively form part of said internal openings and engaging and providing support means for said receptacle means;

a pair of steps respectively disposed adjacent said interior walls in the spaces between the said end walls and said interior walls and extending outwardly from said interior surface, said steps cooperating with said end walls to provide additional support for a plug-in connector;

a plurality of risers respectively disposed adjacent said interior walls and extending upwardly from said interior surface respectively engaging and supporting said receptacle means; and

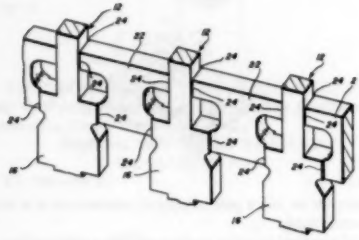
rivet means connecting the housing sections together.

4,428,642

BODY-CARRY ELECTRICAL CONTACT STRIPS

Gary W. Schwindt, Washington, Conn., and Walter W. Wurster, West Covina, Calif., assignors to Litton Systems, Inc., Watertown, Conn.

Filed Jan. 11, 1982, Ser. No. 338,368
Int. Cl.³ H01R *4/14*
U.S. Cl. 339—276 SF **1 Claim**



1. A strip of body-carry electrical contacts formed by a progressive die from flat strip stock, the strip comprising,

a series of identical electrical contacts, aligned in an evenly spaced row,

each contact including

a free-standing upper portion,

a body portion comprising a central circuit board mating section, and

a free-standing lower portion,

a plurality of contact carrier segments located one each between adjacent contacts proximate said body portions for maintaining said contacts integrally joined in said evenly spaced row, and

said contact carrier segments being displaced relative to the plane of the contact strip such that the displacement causes the interface between each carrier segment and each electrical contact to be paritally severed, whereby said contact strip will withstand normal manufacturing processes and wherein said displaced carrier segments may be removed from said contact strip without a metal cutting operation.

4,428,643

OPTICAL SCANNING SYSTEM WITH WAVELENGTH SHIFT CORRECTION

David B. Kay, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1981, Ser. No. 252,508
Int. Cl.³ G02B *27/17*; G03H *1/04*
U.S. Cl. 350—3.71 **7 Claims**

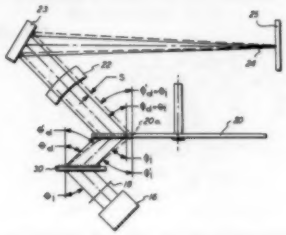
1. An optical scanning system including

a spinner having formed thereon at least one plane linear diffraction grating having a constant grating period d,

a stationary wavelength compensation diffraction grating having properties identical to said grating formed on said spinner surface, said stationary grating placed in a plane parallel and in optical alignment with said spinner grating,

a collimated reconstruction light source of wavelength λ_r which provides a beam of light directed at an angle of incidence θ_i onto said compensation grating, said grating diffracting said beam at a diffraction angle of θ_d,

said incidence angle $\theta_i = \theta_d = 45°$, and the ratio of λ_r to spacing d having a value between 1 and 1.618,



means for rotating said spinner so that the spinner grating rotates through some rotation angle and diffracts a portion of the incident light at diffraction angle θ_d, and

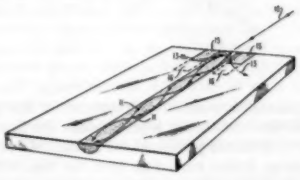
optical means to focus said diffracted beams as a linear scan line on an image plane.

4,428,644

ALIGNMENT OF OPTICAL COMPONENTS

Alastair M. Glass, Rumson; Ivan P. Kaminow, Tinton Falls, and Donald H. Olson, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 108,950, Dec. 31, 1979, Pat. No. 4,334,774. This application Sep. 21, 1981, Ser. No. 304,204
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.14 **4 Claims**



1. An apparatus comprising:

(1) a pyroelectric material having a wavepath which guides electromagnetic radiation, (2) electrodes in intimate contact with said pyroelectric material and in proximity to said wavepath, each of said electrodes having a sheet resistance less than 10^3 ohm/□, a thickness ranging from about 200 Angstroms to about 2000 Angstroms, and a width ranging from about 10 μm to about 1000 μm, and (3) a means for increasing the absorption of said electromagnetic radiation incident on said wavepath relative to the electromagnetic radiation absorbed in the absence of said means for increasing absorption, whereby a portion of any modulated electromagnetic radiation incident on said wavepath is absorbed by said pyroelectric material, the absorption of said portion inducing an electrical current in said electrodes.

4,428,645

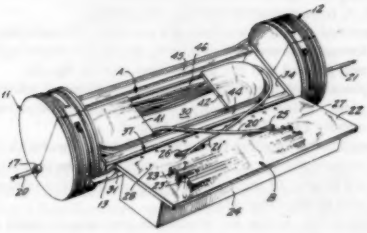
CABLE ACCUMULATOR

Kenneth N. Korbelak, Jackson, and Joseph B. Masterson, Carteret, both of N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Continuation-in-part of Ser. No. 229,192, Jan. 28, 1981. This application Dec. 21, 1981, Ser. No. 332,600

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 17 Claims



4. In a splice case for accommodating splices from individual optical fibers of one multichannel fiber-optical cable end to corresponding optical fibers of another multichannel fiber-optic cable end, wherein said case comprises a frame including two end-wall members of like peripheral contour, and two elongate parallel tie rods rigidly connecting said end-wall members in longitudinally spaced relation, the rod connections being at corresponding peripherally spaced locations on said end-wall members, said end-wall members each having an entry port for through-passage of a different one of the cable ends, and an elongate peripheral-wall closure adapted for removable closure of the included frame volume defined by and between said end-wall members, the improvement comprising an elongate rectangular housing supported by said frame and within said volume, said housing comprising a bottom wall of substantially the longitudinal and transverse extent of said volume, side and end walls upstanding from said bottom wall, a cable-locating core fixed to and upstanding from the bottom wall and of elongate oval configuration and spaced from said side and end walls to define an annular storage volume for coiled accumulation of excess length of one of said cables near the splice region thereof, one of said walls having a port for through-passage of one cable from one end-wall port to coiled accumulation within said annular volume, said core defining with said bottom wall a generally oval storage volume for coiled accumulation of excess length of the other of said cables near the splice region thereof, said bottom wall having a port for through-passage of the other cable from the other end-wall port to coiled accumulation within said generally oval volume, a removable closure for said housing and spanning both said annular and generally oval volumes, and splice-supporting means carried by said closure.

4,428,646

OPTICAL FIBERS HAVING CRYSTALLINE MATERIAL AND METHOD OF MAKING SAME

Paul E. Lighty, Lafayette, N.J., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,348

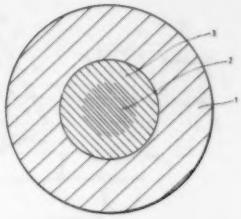
Claims priority, application United Kingdom, Feb. 11, 1981, 8104271

Int. Cl.³ G02B 5/172; C03B 37/025; C03C 3/30

U.S. Cl. 350—96.31 12 Claims

1. An optical fiber preform comprising:

a core having a radial gradient of composition and a refractive index that increases radially inwardly including an outer section of a first two-element compound crystalline material having a predetermined melting point, an inner section of a second two-element crystalline material having a higher refractive index and a lower melting point than said first crystalline material, and a partition layer formed at the interface between the outer and inner sections and including the first crystalline material in a radially inwardly diminishing amount and the second crystalline material in a radially inwardly increasing amount; and



a cladding layer surrounding said core and having a melting point higher than said first crystalline material.

4,428,647

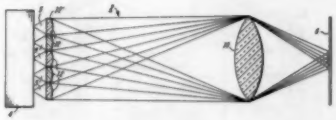
MULTI-BEAM OPTICAL SYSTEM USING LENS ARRAY

Robert A. Sprague, Saratoga, and Donald R. Scifres, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 4, 1982, Ser. No. 439,255

Int. Cl.³ G01J 1/08; G03H 1/22

U.S. Cl. 350—167 6 Claims



1. An optical system comprising a laser array operable to emit from an emitting surface a plurality of output light beams of a set spacing and divergence angle, an objective focusing lens located at a substantial distance from said emitting surface for focusing said output beams at a surface with a spcing substantially different than said set spacing, and lens means located in the optical path between said emitting surface and said objective lens for changing the divergence angle of each of said output light beams independently of the beam spacing as seen by said objective lens, whereby a large portion of each of said output light beams is collected by said objective lens.

4,428,648

TRANSPARENCY VIEWING DEVICE

Richard H. Wiley, 983 Lake Front Rd., Lake Oswego, Oreg. 97034

Filed Nov. 25, 1981, Ser. No. 324,856

Int. Cl.³ G02B 27/02

U.S. Cl. 350—238 8 Claims

1. A transparency viewing device for supporting a transparent color slide at eye level, said device comprising in combination,

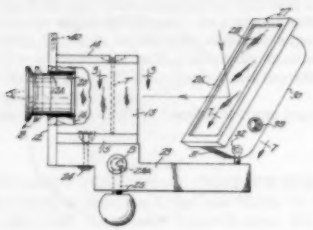
a stand having floor engaging feet and a vertically adjustable member, a horizontal arm carried by said member,

a platform adjustably mounted on said arm,

a housing on said platform, said housing adapted to receive a transparency, said housing including a lens through which the transparency may be viewed, a light diffuser within said housing,

a reflector mounted on said platform and offset from said housing to enable the directing of light rays onto said diffuser, and

mounting means carried by said platform and offset from said housing and mounting said reflector thereon in a



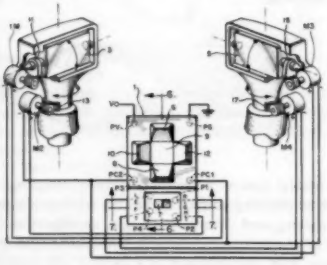
universal manner to facilitate the direction of light rays from various directions onto said diffuser.

4,428,649

POWER MIRROR CONTROL SWITCH

Robert T. Main, Arlington Heights, and Maurice E. Kennedy, Crystal Lake, both of Ill., assignors to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jun. 26, 1981, Ser. No. 277,897
Int. Cl.³ H01H *9/00, 19/00*; B60R *1/06*
U.S. Cl. 350—289 **16 Claims**



9. Apparatus for adjusting the viewing position of a first and a second mirror, comprising:

a first motor and means responsive to the motor for tilting said first mirror up and down;

a second motor and means responsive to the motor for rotating the first mirror to the right and left;

a third motor and means responsive to the motor for tilting said second mirror up and down;

a fourth motor and means responsive to the motor for rotating the second mirror to the right and left;

a printed circuit board having a plurality of conducting areas formed thereon and including means for receiving power and circuit ground and for distributing signals for controlling the movement of said motors;

mirror select means for defining conductive connections on said printed circuit board to select either said first mirror or said second mirror for movement; and

position control means for controlling the movement of the mirror selected by said mirror select means, the position control means including:

a first electrically conducting terminal plate having a plurality of conducting, outwardly extending terminal fingers and means for connecting the plate and terminal fingers to an energizing voltage;

a second electrically conducting terminal plate having a plurality of conducting, outwardly extending terminal fingers and means for connecting the plate and terminal fingers to ground;

means for supporting said first and second terminal plates in insulated, stacked relation above said printed circuit board, so that the terminal fingers of one plate do not overlap the terminal fingers of the other plate; and

control key means for selectively pressing terminal fingers into conductive contact with underlying conducting areas of said printed circuit board to define signals for controlling the operation of said motors.

15. A remote control switch, comprising:

a printed circuit board having a plurality of conducting areas formed thereon and including means for receiving power and ground and for distributing output signals;

a plurality of electrically conducting terminal plates, each plate having a plurality of electrically conducting, outwardly extending terminal fingers;

means for supporting the terminal plates in insulated, stacked relation above said printed circuit board, so that the terminal fingers of each plate do not overlap the terminal fingers of the other plates; and

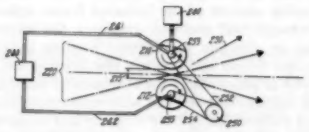
control key means for selectively pressing terminal fingers into conductive contact with underlying conductive areas of said printed circuit board, to generate said output signals.

4,428,650

LINE FOCUS APERTURE FOR OPTICAL BEAMS

Dennis N. Mansell, Albuquerque, N. Mex., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 19, 1981, Ser. No. 312,603
Int. Cl.³ G02B *5/00*
U.S. Cl. 350—319 **1 Claim**



1. An apparatus for restricting the amount of radiation in a line focus of an optical beam comprising:

first and second cylindrical members, each having a polished outer surface and being disposed an equal separation distance on either side of and parallel to an aperture axis, whereby an aperture distance is defined as the shortest distance between said outer surfaces;

means for rotating said first and second cylindrical members about first and second rotation axes parallel to said aperture axis, respectively;

means for varying said aperture distance by changing said separation distance; and

means for circulating coolant fluid through said first and second cylindrical members.

4,428,651

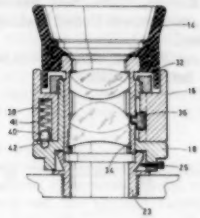
CLICK-STOP FOCUSING OF BINOCULARS

Wilfred Calcutt, Doncaster, England, assignor to Swift Instruments, Inc., Boston, Mass.

Filed Dec. 17, 1981, Ser. No. 331,480
Int. Cl.³ G02B *7/06*
U.S. Cl. 350—556 **1 Claim**

1. In binoculars including focusing means comprising an adjustable, rotatable focusing knob operatively associated with focus adjustment means, whereby rotation of said knob adjusts said focus adjustment means in a manner related to the distance between a viewer employing said binoculars and an object to be viewed, the improvement comprising first click-stop means operatively associated with said rotatable focusing knob, said

click-stop means being effective to abruptly increase the force required to rotate said knob at a focus setting for a first predetermined distance between said object to be viewed and said viewer and wherein said focus adjustment means includes an outer eyepiece barrel and said click-stop means comprises a



spring and a ball associated with said spring, said ball and spring being disposed within said rotatable focusing knob, said ball having a first diameter, said click-stop means further comprising a countersunk cylindrical recess in said outer eyepiece barrel, the cross-sectional diameter of said cylindrical recess being smaller than said first diameter.

4,428,652

FOCUS DETECTING SYSTEM

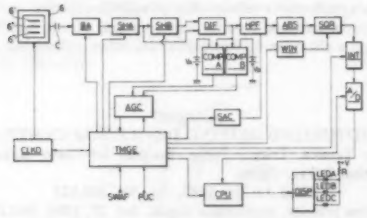
Shinji Sakai; Nobuhiko Shinoda; Takao Kinoshita; Kazuya Hosoe, and Takashi Kawabata, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,578

Claims priority, application Japan, Oct. 23, 1980, 55-149078

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—407 **7 Claims**



1. A focus detecting system for detecting a focusing state of an imaging optical system on an object, comprising:

(A) image scanning means for scanning an object image formed by said imaging optical system to generate a time-serial scanning signal representing a radiation distribution of the image;

(B) processing means for processing the time-serial scanning signal from said image scanning means to generate an output signal representing an image formation state of the image, said processing means including a change detecting circuit for detecting a change with time of the time-serial scanning signal, said change detecting circuit having a high-pass filter circuit;

(C) an amplifying circuit for initial-setting said change detecting circuit, and having input and output ends connected to said change detecting circuit in said processing means, an output impedance of said amplifying circuit being controlled externally; and

(D) impedance controlling means for controlling the output impedance of said amplifying circuit in association with a timing at which the time-serial scanning signal is output from said image scanning means, wherein said impedance controlling means changes the output impedance of said amplifying circuit from low to high substantially in synchronism with a timing at which an effective image scanning signal, the change with time of which is to be detected by said change detecting circuit, is generated from said image scanning means.

4,428,653

MIRROR REFLEX CAMERA WITH AN ELECTRONIC RANGE FINDER

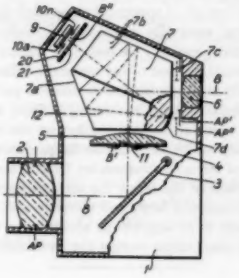
Klaus-Dieter Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,194

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113507

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—403 **6 Claims**



1. A mirror reflex camera comprising:

(a) a picture taking objective having a horizontal optical axis and an object image projected by said picture taking objective;

(b) an electronic range finder comprising a plurality of lens elements (**10*a*–10*n***) mounted in front of an array of photoelectric detectors (**9**);

(c) a viewer system located along said optical axis comprising in series a focusing screen having a plane, a field lens, a pentaprism and an eyepiece, said optical axis being offset in parallel from its original path by two reflections in said pentaprism and exiting said eyepiece;

(d) mirror means comprising a fully specular concave mirror (**7*d***) provided at the lower edge of the exit surface of said pentaprism (**7**) and having a focal plane;

(e) means (**11**) defining a measuring spot in said plane for optically deflecting a first portion (**12**) and a second portion (**8**) of said object image; in the vicinity of said eyepiece (**6**) and in the vicinity of said concave mirror (**7*d***), first and second mutually vertically offset and over-lapping pupil images (AP′,AP″) are generated by said first and second portions, said first pupil image (AP′) being central with respect to said eyepiece (**6**) and generated by said second portion, while said second pupil image (AP″) is generated by said first portion; and

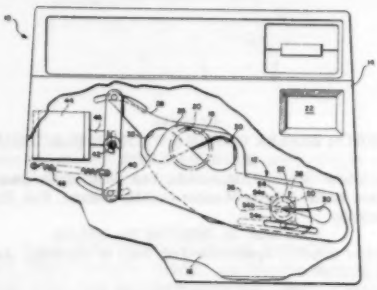
(f) said mirror means projecting said second pupil image (AP″) onto said plurality of lens elements located in said focal plane of said mirror means.

4,428,654

METHOD AND APPARATUS FOR SIMULTANEOUSLY EVALUATING DIFFERENT SPECTRAL FREQUENCIES FROM DIFFERENT SCENE ZONES

Milton S. Dietz, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 20, 1981, Ser. No. 255,694
Int. Cl.³ G03B 7/08, 15/03
U.S. Cl. 354—413 18 Claims



16. A method of exposing an image recordable medium to a scene comprising the steps of:

evaluating a first set of spectral frequencies during an evaluation period generally exclusive of visible spectral frequencies and generally inclusive of infrared from a first predetermined portion of the scene for a duration which is substantially throughout the evaluation period;

generally simultaneously evaluating at least a different second set of spectral frequencies during the evaluation period generally inclusive of visible frequencies and generally exclusive of infrared frequencies from a second predetermined portion of the scene for said duration; and

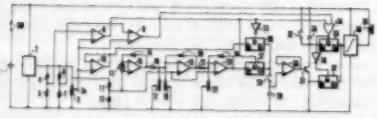
transmitting radiation from said scene to said image recordable medium in an amount in accordance with both said evaluating steps taken during the evaluation period.

4,428,655

MODE SELECTOR DEVICE FOR A CAMERA

Nobuyuki Suzuki, Kawasaki, and Masami Shimizu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,535
Claims priority, application Japan, Sep. 16, 1980, 55-128238; Sep. 16, 1980, 55-128239
Int. Cl.³ G03B 7/08
U.S. Cl. 354—456 16 Claims



1. A mode switching device for a camera comprising:

a shutter apparatus controllable electrically and mechanically:

a shutter time setting member manually settable to at least one shutter time value position for electrical shutter operation;

a signal producing source for producing an electrical signal;

the electrical signal level value of the signal producing source being set in accordance with the setting of the shutter time setting member;

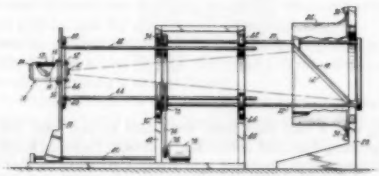
a changeover circuit responsive to the electrical signal value and coupled to the shutter apparatus for changing between electrical control of the shutter apparatus and mechanical control of the shutter.

4,428,656

360° VIEW CAMERA

John R. Gebhart, Enfield, Conn., and Francis X. Ledoux, Springfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 26, 1982, Ser. No. 411,941
Int. Cl.³ G03B 37/00
U.S. Cl. 354—80 2 Claims



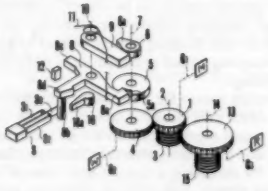
1. A camera for photographing the interior of a cylindrical or conical shaped surface of a specimen including a fixture for supporting said specimen in fixed relationship on one end of said fixture, a lens rotatably mounted on the other end of said fixture, a film magazine for supporting a film, said magazine including a fixed hollow cylindrical member fixedly supported therein for receiving a flat film wrapped therearound, a first mirror mounted in said magazine at a 45° angle relative to the axis of rotation of said first mirror, another cylindrical member in rotating relationship to said fixed cylinder and rotatable with said lens, a second mirror parallely mounted relative to said first mirror and positioned to transmit the image of said inner surface of said specimen and means for imparting rotary motion in synchronous relationship to said first mirror, said second mirror and said lens for exposing said film to said image through a slit opening formed in said other cylindrical member.

4,428,657

MOTORIZED DRIVING DEVICE FOR CAMERA

Nobuo Tezuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 398,823
Claims priority, application Japan, Jul. 27, 1981, 56-117271
Int. Cl.³ G03B 1/00
U.S. Cl. 354—173.1 5 Claims



1. A motorized driving device for selectively driving a winding mechanism and a rewinding mechanism of a camera having selectable winding and rewinding modes of operation, including:

(a) an electric motor:

(b) switching means movable between a first position wherein current is supplied to said motor, and a second position wherein the current supply to said motor is stopped;

(c) transmitting means for operatively connecting said motor to said winding mechanism when the switching mode is

selected, and for operatively connecting said motor to said rewinding mechanism when the rewinding mode is selected;

(d) holding means for holding said switching means in the first position in response to operation of the rewinding mechanism; and

(e) release means for moving said switching means to the second position, said release means being arranged to cooperate with the winding mechanism to release said holding means from holding said switching means.

5. A motorized driving device for selectively driving a winding mechanism and a rewinding mechanism of a camera having selectable winding and rewinding modes of operation, including:

(a) an electric motor;

(b) switching means movable between a first position wherein current is supplied to said motor, and a second position wherein the current supply to said motor is stopped;

(c) transmitting means for operatively connecting said motor to said winding mechanism when the winding mode is selected, and for operatively connecting said motor to said rewinding mechanism when the rewinding mode is selected; and

(d) changeover means for moving said switching means to the first position in response to operation of the rewinding mechanism and for moving said switching means to the second position after a delay of at least a predetermined time after operation of the winding mechanism.

4,428,658

COMBINED FILM CASSETTE UNLOADING AND FILM PROCESSING DEVICE

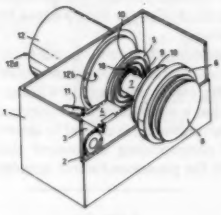
Michael H. Moore, Ilford, and George F. A. M. Turner, both of Ingatestone, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 3, 1982, Ser. No. 438,812

Claims priority, application United Kingdom, Nov. 4, 1981, 8133194

Int. Cl.³ G03D *13/06*

U.S. Cl. 354—310 **5 Claims**



1. A combined film cassette unloading and film processing device which comprises a light-tight closable container comprising, in its interior, means for holding a film cassette to enable a piece of film of determined length to be withdrawn therefrom, together with a film cutting means; a lid member of a processing tank of the film-holding spiral type being rotatably but detachably mounted in a light-tight manner in one side of the container; a spiral being attached to the inner side of the said lid member and so located in the container that the film from a cassette can be wound thereon; and a tank-completing base member located on the opposite side of the container which base member together with the lid and the spiral form a processing tank of the spiral film holding type, the base member being so held in a light-tight manner that, when the film from the cassette has been wound onto the spiral and when the end of said film piece has been cut off from the cassette, the base member can be fitted on to said lid member whilst both are still connected to the container in a light-tight manner, whereupon the completed processing tank can be removed as a unit from the container as an entity once it has been assembled.

4,428,659

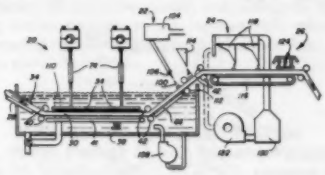
APPARATUS AND METHOD FOR REMOVING SOLUBLE PORTIONS OF A COATING

Lawrence E. Howard, Escondido, Calif., assignor to Napp Systems (USA), Inc., San Marcos, Calif.

Filed Jun. 2, 1981, Ser. No. 269,561

Int. Cl.³ G03D *3/12*

U.S. Cl. 354—317 **37 Claims**



1. In a process for developing a graphic arts article in which the article is exposed, developed, dried, and hardened, the improvement comprising:

immersing said article in a developing solution while repeatedly applying point pressure thereto in a direction generally perpendicular to the coating surface to assist in the removal of soluble portions of said coating.

4,428,660

ROLLER TYPE FIXING UNIT FOR A COPYING MACHINE

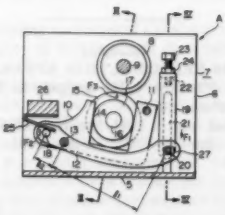
Sinji Matsumoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,586

Claims priority, application Japan, Jul. 20, 1981, 56-112241

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **11 Claims**



1. A roller type fixing unit for a copying machine having an opening and closing frame part used for opening and closing a copying machine body, comprising:

a pair of rollers for thermally fixing a thermoplastic toner image on a sheet passing between said pair of rollers;

means for pressing said pair of rollers against one another and for separating said pair of rollers from one another;

linkage mechanism means connected to said opening and closing frame part and said pressing and separating means for transmitting movement of said opening and closing frame part to said pressing and separating means so that a closing operation of said opening and closing frame part presses said pair of rollers against one another and an opening operation of said opening and closing part separates said pair of rollers from one another, said linkage mechanism means having a mechanical advantage so that a force required to close said opening and closing frame

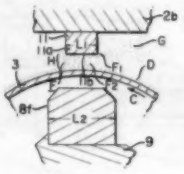
part is multiplied to press said pair of rollers against one another.

4,428,661

MAGNETIC BRUSH TYPE DEVELOPING DEVICE

Keiji Masuda; Shinobu Fujiwara, and Kenichi Matsumoto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,259
Claims priority, application Japan, Mar. 9, 1981, 56-32503
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **12 Claims**



1. In a magnetic brush developing device for developing an electrostatic latent image formed on a charge retaining member, which includes a housing for containing developer, a developing sleeve arranged rotatably in said housing, a plurality of magnets interior of said developing sleeve and a doctor blade for regulating a thickness of a developer layer formed on a circumferential surface of said developing sleeve by a magnetic flux of said magnets,

the improvement comprising:

a magnetic material fixed on an internal surface of said housing and downstream of said doctor blade as viewed from the direction of the rotation of said developing sleeve,

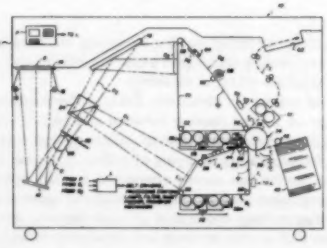
said magnetic material extending in the direction of the width of said developing sleeve, and being spaced from said circumferential surface of said developing sleeve, and said magnetic material being positioned opposite to at least one of said magnets arranged in said developing sleeve.

4,428,662

COLOR REPRODUCTION APPARATUS

Pierce B. Day, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,673
Int. Cl.³ G03G *15/01, 13/01*
U.S. Cl. 355—4 **10 Claims**



1. In apparatus having means for developing latent image charge patterns on image-receiving members with pigmented marking particles to form transferable images respectively corresponding to related color images of multicolor input information, wherein said developed images are transferred to a receiver member to produce a multicolor reproduction, the improvement comprising:

means for simultaneously producing two different ones of said latent image charge patterns on discrete areas of said image-receiving members respectively;

means or producing a third latent image charge pattern, different from said aforementioned latent image charge patterns, on a discrete area of one of said image-receiving members adjacent to one of said aforementioned discrete areas; and

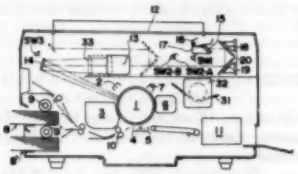
means for transferring developed images to a receiver member in superimposed register, with a substantial portion of the transfer of the developed images of said simultaneously produced latent image charge patterns occuring simultaneously.

4,428,663

ELECTROPHOTOGRAPHIC COPYING MACHINE

Hideo Ito; Yutaka Irie, both of Toyokawa, and Minoru Nakamura, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1982, Ser. No. 398,923
Claims priority, application Japan, Jul. 20, 1981, 56-114026
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **12 Claims**



1. An electrophotographic copying machine of the type in which a reciprocating means reciprocates for exposing a photoconductive member successively to an image of an original and the image formed on the photoconductive member is transferred to a sheet of paper fed by paper feeding means, the machine comprising:

means for controlling said reciprocating means in a specified mode of possible multi-copying modes so as to move said reciprocating means continously without stopping in such a manner that a supplementary reciprocating movement, involving no exposure, is caused to intervene between the strokes of reciprocating movement that experience an exposure of the photoconductive member.

4,428,664

METHOD AND DEVICE FOR CLEANING PHOTOSENSITIVE SCREEN IN AN IMAGE FORMING APPARATUS

Tadashi Sato, Kokubunji, and Keiji Tanaka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 947,198, Sep. 29, 1978, which is a continuation of Ser. No. 549,437, Feb. 12, 1975, abandoned. This application Oct. 31, 1980, Ser. No. 204,010
Claims priority, application Japan, Feb. 25, 1974, 49-22149; Jul. 27, 1974, 49-86379
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **3 Claims**

1. Image forming apparatus comprising:

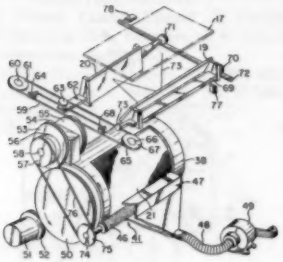
a retention-type photosensitive screen having a a multitude of tiny openings formed therethrough;

means, including a corona charger for applying corona charge to one side of said screen, for forming a primary latent image on said screen;

means for applying a modulating ion current to the opposite side of said screen to form a secondary latent image on an

insulative surface, said modulating means being operative a plurality of times for each operation of said primary image forming means to thereby form a plurality of secondary images from a single primary latent image;

means for detecting the operation of said primary image forming means and producing a detection output; and



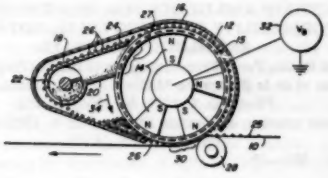
means for periodically cleaning said photosensitive screen, said cleaning means being responsive to the detection output from said detecting means to initiate a cleaning operation by said cleaning means, whereby between sequential cleaning operations a plurality of secondary images are formed.

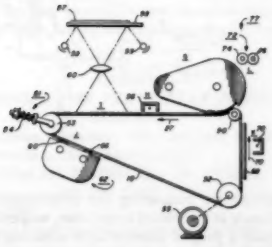
4,428,665

APPARATUS, PROCESS FOR REMOVAL OF TONER PARTICLES

Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1981, Ser. No. 318,884
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **10 Claims**





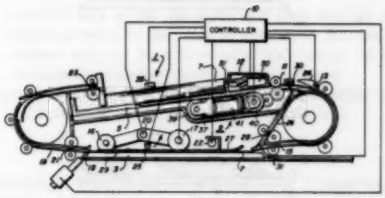
1. A process for simultaneously removing, and transporting insulating toner particles from a flexible imaging member which comprises (1) providing a cleaning roll containing on a portion of its surface insulating carrier particles, which cleaning roll contains therein magnets, and magnetic strips, (2) providing a moving flexible imaging member deflected in an arc, wherein there results a cleaning zone encompassed by and situated between the cleaning roll and the deflected flexible imaging member, which member consists essentially of a substrate, a photogenerating layer, and an amine transport layer, (3) actuating the cleaning roll causing the insulating carrier particles to contact he insulating residual toner particles contained on the deflected moving flexible imaging member (4) removing the residual toner particles from the deflected flexible imaging member as a result of said contact, (5) depositing the removed toner particles on the cleaning roll, (6) transporting the removed toner particles on the cleaning roll, (7) removing the insulating carrier particles, (8) removing the insulating toner particles, (9) and subsequently redirecting the removed insulating carrier particles to the cleaning roll, wherein the flexible imaging memberis deflected in an arc of from about 5 degrees to about 50 degrees.

4,428,666

DOCUMENT DESKEWING SYSTEM

Russell L. Phelps, Penfield; Denis J. Stemmle, Williamson, and Timothy M. Minerd, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1982, Ser. No. 404,255
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **9 Claims**



1. In a document sheet feeding and registration apparatus for deskewing a document sheet relative to a desired copying position on a copier platen while feeding the document sheet onto the platen into said copying position, the improvement comprising:

means for obtaining an electrical signal corresponding to the actual velocity of the document sheet being fed onto the platen,

automatic document sheet deskewing means for deskewing the document sheet on the platen as it is being fed into said copying position; and

means for actuating said automatic document sheet deskewing means at a precise actuating time occurring slightly before the document sheet reaches the copying position,

said actuating time of said document sheet deskewing means being controlled by said electrical signal corresponding to the actual velocity of the document sheet.

4,428,667

DOCUMENT DESKEWING SYSTEM

Russell L. Phelps, Penfield; Jeffrey L. Sisson, Macedon, and Karl E. Liechty, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

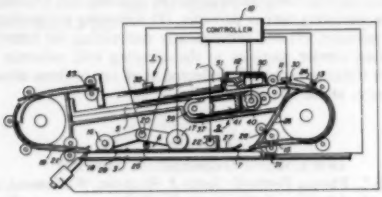
Filed Aug. 2, 1982, Ser. No. 404,254
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **15 Claims**

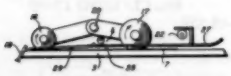
1. In a document sheet feeding and registration apparatus for deskewing and registering a document sheet relative to a copying position on a copier platen by feeding it against a sheet aligning document registration means, the improvement comprising:

first document sheet feeding means for initially feeding a document sheet towards the registration means comprising transversely extending high friction sheet engaging

and feeding means for resisting skewing of the document sheet as it is being fed thereby;

second document sheet feeding means adjacent said registration means comprising a single roller for engaging the leading edge area of the document sheet intermediately thereof, said second document sheet feeding means providing low rotational resistance to deskewing of the document sheet while feeding the document sheet into alignment with said registration means,





and disengagement means for removing said first document sheet feeding means from said high-friction engagement with the document sheet after the leading edge of the document sheet is under the influence of said second document sheet feeding means but before the document sheet engages said registration means so that control of the document sheet is only by said second document sheet feeding means during the feeding of the document against the document registration means and its deskewing thereby.

4,428,668

RANGE INDICATING DEVICE

Gordon Redington, 1759 N. Jackson St., St. Paul, Minn. 55117

Filed Sep. 24, 1981, Ser. No. 305,118
Int. Cl.³ G01C *3/24*
U.S. Cl. 356—17 **4 Claims**

1. An optical device to indicate a measured distance to a sighted object, having in combination

a unitary device, of which all parts thereof have no relative movement, comprising

a housing having an elongated angular form in plan having a pair of spaced top and bottom walls having therebetween a pair of spaced side walls in an opposed relation,

one of said side walls having an angled portion conforming to the perimeter of the top and bottom walls thereabove and therebelow, a mirror carried by said angled wall portion facing in the direction of a sighted object,

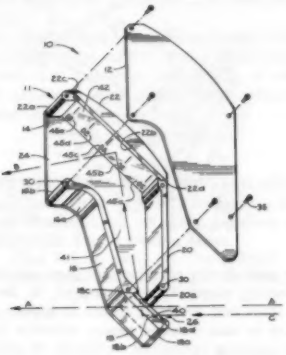
said side walls having a pair of corresponding end wall portions spaced apart to permit said mirror to have a line of sight to sighted object and to bear the image of said object,

indicia on said mirror comprising distance measurement markers,

said side walls having their corresponding other end portions spaced apart to form a window,

a mirror aligned with said window positioned to reflect the image of a sighted object and the measurement markers from said first mentioned mirror,

the other of said side walls carrying said second mentioned mirror upon a portion thereof to be seen through said window,



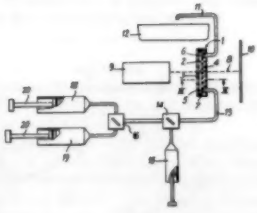
wherein views of the sighted object are sighted partially by direct line of sight by the operator and partially by reflection upon said second mentioned mirror of the image of the sighted object upon said first mentioned mirror and by coincidence of said views upon a reflected measurement marker upon said second mentioned mirror by pivoting said housing upon a vertical axis to ascertain the distance of the sighted object.

4,428,669

METHOD AND DEVICE FOR MEASURING THE DEFORMABILITY OF LIVING CELLS, NOTABLY OF RED BLOOD CORPUSLES

Marcel Bessis, Paris, France, assignor to Institut Nationale de la Sante et de la Recherche Medicale, Paris, France

Filed Jun. 1, 1981, Ser. No. 269,252
Claims priority, application France, Jun. 6, 1980, 80 12592
Int. Cl.³ G01N *33/48*
U.S. Cl. 356—39 **15 Claims**



1. A method for measuring the deformation capacity of living cells such as red blood corpuscles, suspended in a liquid through which a parallel beam of light is passed to observe the diffraction pattern reproduced by the cells in order to measure the characteristic dimensions of the diffraction rings, said method comprising the steps of: passing the suspension contained in the liquid into a tubular channel with a fixed wall and having a constant cross section, in a direction substantially perpendicular to said beam; adapting said suspension into the form of a flow which is laminar or close to the laminar state, in a location in said channel where at least a part of said flow is

submitted to substantial shearing forces to effect cell deformation; and passing said beam through said suspension in said channel.

4,428,670

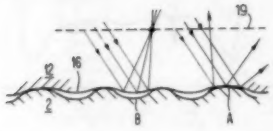
FINGERPRINT SENSING DEVICE FOR DERIVING AN ELECTRIC SIGNAL

Hartwig Ruell, Mount Laurel; Edward J. Devinney, Jr., Delanco, and Ming-Yee Chiu, Voorhees, all of N.J., assignors to Siemens Corporation, Iselin, N.J.

Continuation of Ser. No. 176,701, Aug. 11, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 317,401

Int. Cl.³ G06K *9/00*; G01N *21/17*

U.S. Cl. 356—71 **17 Claims**



1. A fingerprint sensor for deriving an electric output signal according to the ridges and valleys of a finger under investigation, said sensor comprising, in combination:

(a) an elastic, pressure-sensitive contact surface formed by a transparent elastic material for receiving a contact pressure by said finger, thereby changing the structure of said surface in accordance with the fingerprint pattern of ridges and valleys of said finger, whereby the regions of the contact surface associated with the fingerprint valleys are not in contact with the finger and form small concave focusing mirrors, having their focal points along a focusing plane which is parallel to, and at the focal distance of said focusing mirrors away from, said contact surface;

(b) a light source for passing substantially parallel light through said transparent elastic material to said contact surface, whereby in the presence of said finger said regions of the contact surface associated with the valleys which form said focusing mirrors reflect the light impinging on these regions and focus this light at said focusing plane, thus forming a focused light pattern at said plane in accordance with the fingerprint pattern of said finger;

(c) photodetector means having a light sensitive area for measuring the distribution of light impinging on said area;

(d) optical means focused on said plane for transmitting said focused light pattern to said light sensitive area of said photodetector means; and

(e) output means associated with said photodetector means for deriving said electric output signal in response to the pattern of light falling on said light sensitive area.

4,428,671

OPTICAL DEVICE FOR VERTICALLY POSITIONING A SEXTANT

Thomas D. Davies, Potomac, Md., assignor to Davis Instruments Corporation, San Leandro, Calif.

Filed Jul. 15, 1981, Ser. No. 283,583

Int. Cl.³ G01C *1/10*

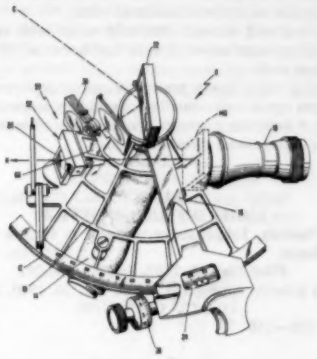
U.S. Cl. 356—144 **14 Claims**

1. A device for vertically positioning a sextant to minimize tilt error in the measurement of a celestial body's altitude relative to the horizon comprising:

optical means fixed to the sextant and positioned in the line of sight of the sextant's horizon mirror and eyepiece, for producing in a portion of the sextant's viewing area a secondary horizon which will align with the direct horizon only when the sextant is vertical,

said optical means including a prism which will divert light rays a predetermined angle in a plane perpendicular to its optical axis,

said prism being positioned between the index mirror of the sextant and the horizon mirror of the sextant and between the horizon mirror and eyepiece so that any portion of a celestial body image that is reflected from the index mir-



ror and falls within the prism will pass through and be diverted twice by the prism to ensure that the user of the sextant will not place a celestial body image on a false horizon line diverted through the prism, and

means for adjusting the position of the optical means relative to the sextant to thereby calibrate the device.

4,428,672

VARIABLE THRESHOLD WORKPIECE EXAMINATION

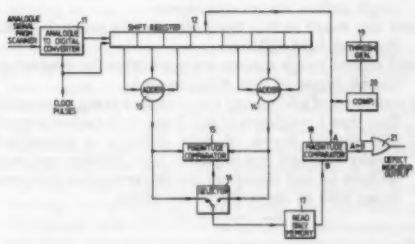
Martin E. Allard, Brixham, and Joseph A. Wilcox, Havant, both of England, assignors to Brent Chemicals International Limited, Buckinghamshire, England

Filed Oct. 15, 1981, Ser. No. 311,739

Claims priority, application United Kingdom, Oct. 17, 1980, 8033661

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—237 **18 Claims**



1. A method of examining a workpiece that has been treated so that the flaws in it are revealed by concentrations of indicator on its surface to examine it for the presence of flaws, including:

scanning the surface of said workpiece and providing an output signal representative of the luminance of regions of said surface of said workpiece;

storing said output signals representative of said luminance of regions of said workpiece in a memory;

forming a first average signal representative of average luminance of a number of said regions to one side of one region;

forming a second average signal representative of average

luminance of a number of regions to the other side of said one region;

comparing said first and second average signals to determine which of said first and second average signals indicates the greater concentration of said indicator;

selecting whichever of said first and second average signals indicates said greater concentration of said indicator and using this to derive a threshold value;

comparing said derived threshold value with said output signal representative of said luminance of the said one region; and,

indicating that a flaw is present in said workpiece when said output signal representative of said luminance of said one region indicates a greater concentration of indicator than does said derived threshold value.

4,428,673

LIGHT DIFFUSION DEVICE

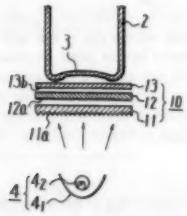
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Japan

Filed May 18, 1981, Ser. No. 264,282

Claims priority, application Japan, Jun. 26, 1980, 55-87105

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—240 **13 Claims**



1. A light diffusion device for interposition between a light source and a transparent object comprising:

at least one light transmitting plate;

first and second rough surfaces on said at least one light transmitting plate;

light from said light source passing progressively through said first rough surface and then through said second rough surface toward said object;

said first rough surface being effective for producing a first degree of light diffusion;

said second rough surface being effective for producing a second degree of light diffusion; and

a roughness of said second rough surface being substantially finer than a roughness of said first rough surface whereby said second degree of light diffusion is substantially greater than said first degree of light diffusion and rough surfaces on said object are thereby prevented from interfering with an inspection of said object.

4,428,674

METHOD AND INSPECTION APPARATUS FOR INSPECTING AN OBJECT, IN PARTICULAR A BOTTLE

Hayo Giebel, Lindemoosweg 25, Traubing, Fed. Rep. of Germany D-8131, and Heinz Gutschale, Brunnerstrasse 9, München, Fed. Rep. of Germany D-8000

Filed Jul. 23, 1981, Ser. No. 286,350

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028942

Int. Cl.³ G01N *21/90*

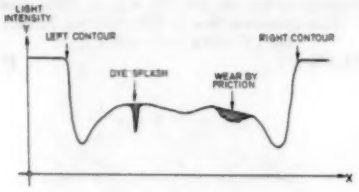
U.S. Cl. 356—240 **13 Claims**

1. In a method of inspecting an object, in particular a bottle, which is irradiated by a radiation that is received and converted into an electrical videosignal which is converted into a digital signal, points of fault in said object being recognised by alterations in intensity between said digital signals from two adjacent image spots the improvement wherein

(1) only alterations in intensity which exceed a definite threshold level are recorded as the start of a point of fault and the end of a point of fault;

(2) for each of said points of fault one or more characteristic quantities are determined;

(3) said characteristic quantities are divided up into different classes corresponding with their magnitudes;



(4) the frequency distribution of the occurrence of said characteristic quantities in the different classes is established by adding; and

(5) said frequency distribution established is correlated with predetermined frequency distributions in order to decide about the quality of said object.

2. A method as in claim 1, wherein said definite threshold level is set on the basis of that brightness of the image of said object and is determined by integration of the brightness along a vertical line of image spots.

4,428,675

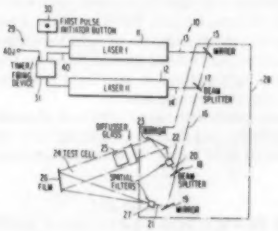
METHOD OF AND APPARATUS FOR DOUBLE-EXPOSURE HOLOGRAPHIC INTERFEROMETRY

William K. Witherow, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 17, 1981, Ser. No. 274,708

Int. Cl.³ G01B *9/025*

U.S. Cl. 356—347 **4 Claims**



1. In apparatus for double-exposure holographic interferometry having a laser responsive to an applied firing signal for producing a pulsed output beam, an optical system for splitting the output beam into a reference beam and a scene beam, and an initiator circuit for generating and applying a firing signal to the laser, the improvement comprising:

(a) a second laser responsive to an applied firing signal for producing a pulsed output beam which is substantially parallel to the beam produced by said first laser and which is split by said optical system into reference and scene beams that substantially coincide with the reference and scene beams produced by said optical system; and

(b) a timer/firing device responsive to the firing of the first

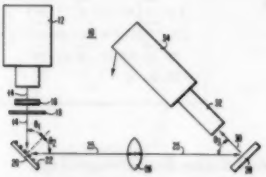
laser for generating and supplying a firing signal to the second laser a predetermined period later.

4,428,676

OPTICAL SYSTEM FOR OBLIQUE VIEWING

Jean C. A. Chastang, Mahopac, and Robert F. Koerner, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1981, Ser. No. 314,320
Int. Cl.³ G03B *21/00*
U.S. Cl. 356—354 **6 Claims**



1. An optical system for the oblique viewing of a substrate comprising

means for reflecting an image of the surface of the substrate at a first angle of θ_2 with the perpendicular to the substrate,

a diffraction grating,

directing means for projecting said reflected image on said grating at a second angle of θ_3 with the perpendicular to said grating to provide a diffracted beam normal to said grating, said grating having a period $a=\lambda/\sin\theta$ where λ is the wavelength of the diffracted beam, said directing means providing a magnification of one,

lens means for projecting said diffracted beam, and

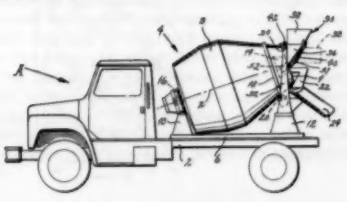
means for detecting said projected diffracted beam wherein a high resolution distortion-free image of said substrate is obtained.

4,428,677

HOPPER FOR MIXER UNIT OF A CONCRETE TRANSPORT VEHICLE

Paul W. Schreiter, Jr., St. Louis, Mo., assignor to Concrete Transport Mixer Co., St. Louis, Mo.

Filed Apr. 2, 1982, Ser. No. 365,007
Int. Cl.³ B28C *5/20, 5/42*
U.S. Cl. 366—41 **14 Claims**



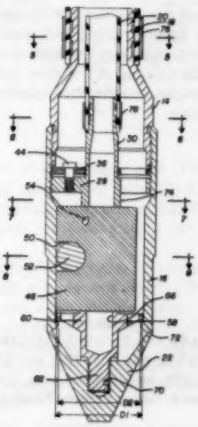
1. In combination with a mixer unit for a concrete transport vehicle, said mixer unit including a frame, a drum mounted on the frame for rotation relative to the frame, the drum having one of its ends elevated above the other of its ends with the elevated end being open for introducing concrete mix into and discharging it from the drum, and a discharge chute mounted on the frame and extending away from the open end of the drum; an improved hopper for directing concrete mix into the elevated open end of the drum, said hopper comprising: a fixed section of rigid shape mounted on the frame in a fixed position with respect thereto and being open at its top and at its bottom, with the open top being located externally of the drum and being presented directly upwardly and with the open portion of the bottom facing and opening into the elevated open end of the drum; and a movable section of rigid shape located externally of the drum and having opposite ends that are open, the movable section being capable of moving from an extended position to a storage position with respect to the fixed section, the movable section when in its extended position having one of its ends at the open top of the fixed section and forming an upwardly directed continuation of the fixed section to in effect extend the height of the hopper, the movable section when in its storage position being located such that the open top of the fixed section is generally unobstructed and constitutes the highest portion of the hopper.

4,428,678

CONCRETE VIBRATOR

John S. Lyle, 671 Cody St., Denver, Colo. 80215

Filed Sep. 30, 1982, Ser. No. 431,593
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—124 **4 Claims**



1. A vibrator, comprising:

a housing having an end portion;

a rotor contained in said housing;

inlet means operatively associated with said housing for supplying pressurized fluid to said rotor so that said rotor rotates in said housing to produce vibrations; and

means operatively connected to said end portion of said housing for preventing the separation of said end portion from said housing, said means for preventing separation including a plate positioned adjacent to said end portion of said housing, and a shaft joined to said plate and connected to said housing end portion, said plate being detached from said inlet means, said end portion being held to said housing using said plate when said end portion becomes worn and tends to separate from said housing.

4,428,679

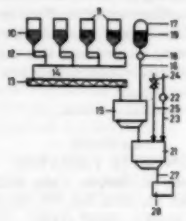
PROCESS FOR MIXING AND COOLING ELECTRODE MATERIAL

Werner K. Fischer, Venthone, Switzerland; Felix Keller, Brielle, Netherlands, and Max Hänni, Schaffhausen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 31, 1980, Ser. No. 135,870
Claims priority, application Switzerland, Apr. 5, 1979, 3194/79
Int. Cl.³ B01F *15/02, 15/04, 15/06*
U.S. Cl. 366—141 **16 Claims**

1. Process for preparing a material selected from the group

consisting of (1) a dry material, and (2) a mixture of dry material and electrode binding agent which is used for the production of electrodes, in particular in the manufacture of electrodes for production of aluminum characterized by mixing, degassing and change of temperature, including the steps which comprises: providing a material selected from the group



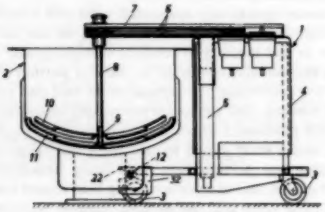
consisting of (1) said dry material, and (2) said dry material and electrode binding agent; treating said material by turbulent stirring or fluidizing, degassing and homogenizing, and simultaneously thermally treating in a system which is, at least in part, dust and gas-tight, and thereby obtaining a homogenized and degassed mixture.

4,428,680

METHOD AND APPARATUS FOR MIXING LIQUID AND PASTE-LIKE SUBSTANCES

Goran Persson, Vastra, and Lars Johnson, Gothenburg, both of Sweden, assignors to Goran Persson Maskin AB, Gothenburg, Sweden

Filed Jan. 26, 1982, Ser. No. 342,764
Claims priority, application Sweden, Jan. 30, 1981, 8100670
Int. Cl.³ B01F *7/22*
U.S. Cl. 366—296 **6 Claims**



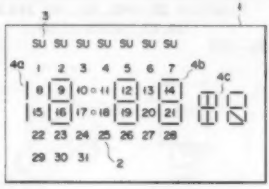
1. A method for mixing liquid and paste-like substances, for example while preparing food in pots, comprising, immersing two coaxially vertically spaced mixers in the substance to be mixed, rotating the two mixers in opposite directions with respect to each other, raising and lowering the mixers simultaneously in the vertical direction through the substance while rotating, mechanically lifting a portion of the substance layer by layer by portions of each mixer and simultaneously mechanically pressing downwardly another portion of the substance layer by layer by other portions of each mixer thereby producing upward and downward circulatory motion of the substance.

4,428,681

DATE DISPLAY DEVICE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan

Filed Dec. 13, 1979, Ser. No. 103,222
Claims priority, application Japan, Dec. 25, 1978, 53-160364
Int. Cl.³ G04B *19/22, 19/24*
U.S. Cl. 368—21 **9 Claims**



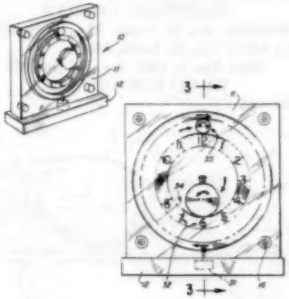
1. A date display device comprising:
a specific date memory means for storing date data of specific days including the holidays of a plurality of different local districts;
district select means for selecting a specific district from among said plurality of different local districts;
date data reading means coupled to said district select means for reading from said specific date memory means the date data of the specific days of the local district which is selected by said district select means; and
date display means coupled to said date data reading means for displaying the date data of the specific days which is read out by the action of said date data reading means.

4,428,682

CLOCK MECHANISM

Munroe A. Winter, 333 Crescent Dr., Lake Bluff, Ill. 60044

Filed Sep. 29, 1982, Ser. No. 428,419
Int. Cl.³ G04B *19/04*
U.S. Cl. 368—238 **14 Claims**



1. A clock mechanism comprising:
a fixed ring defining an inner annular surface and an outer annular surface;
an hours disc disposed to roll against one of said surfaces;
means for causing said hours disc to traverse the full annular extent of the engaged fixed ring, surface once every twelve hours;
a minutes disc disposed to roll against the other of said surfaces; and
means for causing said minutes disc to transverse the full annular extent of said engaged other of said surfaces once every hour, whereby the disposition of said hours disc relative to said fixed ring may indicate hour time and the

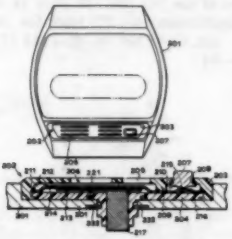
disposition of said minutes disc relative to said fixed ring may indicated minutes time.

4,428,683

ELECTRICAL CONNECTION CONSTRUCTION FOR ELECTRONIC TIMEPIECE

Motoyuki Saito, and Hideo Hatanaka, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 159,446, Jun. 13, 1980, Pat. No. 4,403,315. This application Jul. 8, 1982, Ser. No. 396,441
Claims priority, application Japan, Jul. 23, 1979, 54-92621
Int. Cl.³ G04C *21/16*
U.S. Cl. 368—250 **4 Claims**



1. An electronic timepiece assembly comprising a switch upper plate having a contact pattern formed on the lower surface thereof, said contact pattern including a plurality of spaced terminals, a connector having a plurality of spaced electrical conductors engaging said terminals at the upper ends of said conductors and adapted to engage a module at the lower ends of said conductors, said switch upper plate contact pattern further including a plurality of spaced terminal portions, a switch lower base having a plurality of spaced electrically conductive elements on the upper surface thereof, each of said conductive elements being disposed in alignment with a corresponding pair of said terminal portions on said switch upper plate, and a plurality of projections operable from the outside so as to be resiliently deformed and bring a selected pair of said spaced terminal portions and a corresponding one of said conductive elements into engagement to complete a selected circuit, said electronic timepiece assembly further including a case within which said switch upper plate and said switch lower plate are disposed, a button box mounted in said timepiece case and including a lower button box case and an upper cover having said sound-emitting slits therein, an oscillation plate disposed between said upper cover and said lower button box case, said upper cover also including a button-receiving opening therein disposed laterally of said slits, a movable button received in said opening, said oscillation plate including a first alarm sound-emitting portion extending below said slits and a second portion extending below said button, said second portion including a projection engageable by said button.

4,428,684

APPARATUS FOR MEASURING MELTING POINT AND BOILING POINT OF GAS

Yasuo Kuraoka, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

Filed Jan. 4, 1982, Ser. No. 337,078
Claims priority, application Japan, Jan. 30, 1981, 56-12607
Int. Cl.³ G01N *25/04, 25/08*
U.S. Cl. 374—25 **1 Claim**

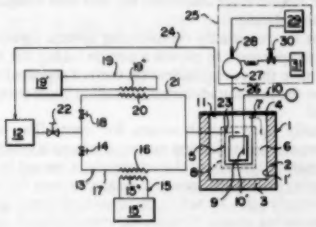
1. An apparatus for measuring the melting point and the boiling point of a gas, comprising in combination:

(a) a heat insulating outer tank (1) with an inner wall (1');

(b) an inner tank (5) within said outer tank (1), a heat medium passage (6) defined between said inner tank (5) and said inner wall (1');

(c) a sample cell (9) for holding a gas sample, said sample cell (9) being within said inner tank (5), a gas temperature measuring instrument (10) disposed to measure the temperature of said sample gas within said sample cell;

(d) an inert reference gas source (12), a piping system (13) connecting said inert gas source to said inner tank (5) including an inert gas outlet (23) within said inner tank (5), a heating path (17) with a first valve (14) and a cooling path (21) with a second valve (18), said paths (17, 21) extending between said inert gas source (12) and said outlet (23), heating means (15, 16) adjacent and operatively coupled to said heating path (17) to heat inert gas flowing along said heating path (17) from said inert gas source (12) and said outlet (23), and cooling means (19, 20) for cooling inert gas flowing along said cooling path (21); and,



(e) gas pressure regulating means (25) coupled to said sample cell (9) including a pressure sensor (28), a pressure controller (29), and, a pressure regulating tank (27);

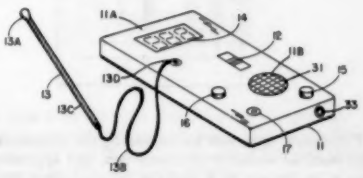
whereby, the inert gas is flowed and regulated through both the heating and cooling paths (17, 21), and the pressure is regulated by said pressure regulating means (25), so that the melting point and the boiling point can be measured and ascertained.

4,428,685

TEMPERATURE TALKING INDICATING DEVICE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Christrian Grund, 2035 Burr Ave., Bronx, N.Y. 10461

Continuation-in-part of Ser. No. 68,609, Aug. 22, 1979, abandoned, and Ser. No. 81,365, Oct. 1, 1979. This application Oct. 2, 1980, Ser. No. 193,284
Int. Cl.³ G01K *7/00*; G10L *1/10*
U.S. Cl. 374—163 **14 Claims**



1. A patient temperature measuring device comprising:

a support including a housing,

a temperature sensing electrically operated transducer,

a micro-electronic circuit means supported within said housing and connected to said transducer for receiving signals generated when said transducer senses temperature of material adjacent said transducer and operable to process

said signals and generate output signals indicative of the temperature sensed,

first temperature indicating means connected to receive signals from said electrical circuit means for displaying indications of the temperature sensed by said transducer, said first temperature indicating means including latch means for retaining a an indication of temperature sensed by said temperature sensing transducer, and readable display means for displaying said temperature sensed,

second temperature indicating means connected to said electrical circuit means, and said first temperature indicating means, said second temperature indicating means including synthetic speech signal generating electronic circuit means and means for converting synthetic speech signals generated thereby to speech sounds indicative of the temperature displayed by said first temperature indicating means,

means for repeatedly reproducing speech signals indicative of temperature to permit a person taking the temperature to have the verbal indication thereof repeated in the event that the first sound-verbal indication is not properly heard, and

normally open switch means for controlling said second temperature indicating means to generate synthetic speech signals indicative of the temperature sensed by said transducing means and sound operated means for closing said normally open switch to cause said synthetic speech signal generating means to generate speech signals indicative of the temperature sensed by said transducing means.

4,428,686

THERMOCOUPLE PYROMETRIC APPARATUS

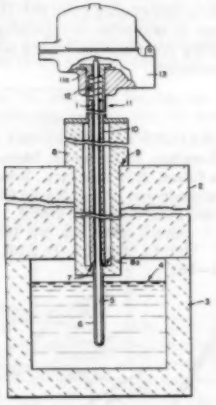
Jean A. Brax, Chalon sur Saone, France, assignor to Saint-Gobain Emballage, France

Filed Oct. 7, 1981, Ser. No. 309,257

Claims priority, application France, Oct. 14, 1980, 80 21903

Int. Cl.³ G01K *7/02*; H01L *35/02*

U.S. Cl. 374—179 **9 Claims**



1. Pyrometric apparatus for measuring the temperature of a molten material within a refractory unit, said apparatus comprising a tip formed of a material selected from the group consisting of platinum and an alloy of platinum both chemically and mechanically resistant to action of the molten material and the atmosphere above the molten material within a channel of said unit, said tip being closed at one end and having an opening at the other end, a rod received in said tip substantially to the depth of said closed end, a temperature indicating means supported at the other end of said rod, at least one thermocouple means disposed in said rod at a position to respond to the temperature of the molten material within said channel, each said thermocouple means connected to said temperature indicating means, means for supporting said tip on said unit so that said apparatus extends into said channel and the molten material within said channel, and a brace, said brace comprising a tubular body surrounding said rod and mounted by said support means to extend between said tip and other metal parts of said apparatus thereby to both mechanically and thermally insulate said tip and metal parts.

4,428,687

FLOATING SEAL FOR EARTH BORING BIT

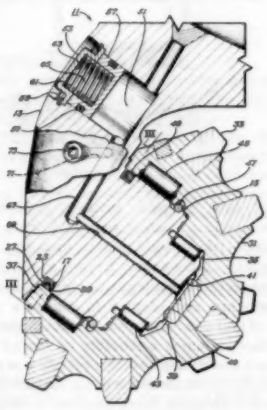
Anton F. Zahradnik, Corsicana, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 262,239, May 11, 1981, abandoned.

This application May 27, 1983, Ser. No. 497,217

Int. Cl.³ F16C *33/72*; F16J *15/34*

U.S. Cl. 384—94 **6 Claims**



6. In an earth boring bit of the type having a cutter rotatably mounted with bearings on a depending shaft, an improved seal means for sealing the bearings, comprising in combination:

an annular groove formed in the shaft with a rectangular transverse cross-section and inner and outer side walls;

a split supporting ring located in the groove, the supporting ring being expansible and having a minimum inner diameter that is larger than the inner diameter of the groove, the supporting ring having a cross-sectional width slightly less than the cross-sectional width of the groove;

a backup ring of elastomeric material located in the groove in contact with the outer side wall, the inner circumference of the backup ring being in contact with the support ring and its outer circumference in contact with the cutter; and

an elastomeric ring of circular cross-section pressed radially outward against the cutter by the supporting ring for slidingly sealing with the cutter and also pressed between the backup ring and the inner side wall of the groove, to provide sealing of the sides of the elastomeric ring.

4,428,688

RETAINER AND BEARING ASSEMBLY

John C. McGregor, Jr., Springfield, Ohio, assignor to Pentaflex, Inc., Springfield, Ohio

Filed Apr. 22, 1981, Ser. No. 256,358

Int. Cl.³ F16C *23/04*

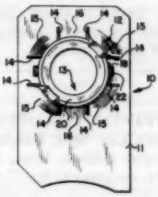
U.S. Cl. 384—208 **16 Claims**

1. A retainer for a bearing having a spherical outer surface comprising:

a substantially planar support member having an opening therein,

a first pair of diametrically opposed rigid lip members extending into said opening and curving outwardly from one face of said planar member, and

a second pair of diametrically opposed rigid lip members extending into said opening and curving outwardly from the face of said planar member opposite said first pair of lip members,



said retainer being further characterized in that the length and angle of inclination of said lip members relative to said support member are such that a bearing having an outer spherical surface can be inserted into said opening with its central axis parallel of said planar member and rotated such that its central axis is normal to said planar member whereupon said lip members fixedly engage said bearing such that relative axial movement between said bearing and said planar member is prevented.

4,428,689

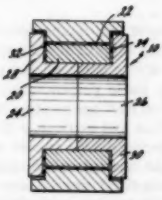
BEARING

Bruce R. Choate, Saugus, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed Apr. 21, 1981, Ser. No. 256,083

Int. Cl.³ F16C *33/04*

U.S. Cl. 384—296 **7 Claims**



1. In combination,

a movable member made from a relatively hard material,

a bearing liner disposed on a first particular surface of the movable member in a thin layer and provided with relatively incompressible characteristics and with characteristics of resisting wear and fatigue, and

a stationary member made from a relatively harder material than the movable member and disposed in frictional relationship with the bearing liner,

means disposed on the opposite side of the stationary member from the movable member for retaining the atationary member against the movable member and for inhibiting any lateral wobble between the stationary and movable members,

the retaining means being formed from a pair of sleeves abutting each other at an intermediate position and abutting the movable and stationary members at their extremities.

4,428,690

THERMAL RECORDING PRINT HEAD

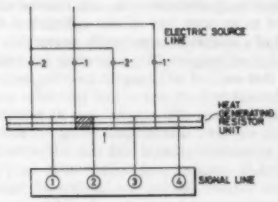
Tsunemasa Mita, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,600

Claims priority, application Japan, Jul. 24, 1981, 56-115396

Int. Cl.³ G01D *15/10*

U.S. Cl. 400—120 **5 Claims**



1. In a thermal recording print head for use in a thermal recording system having means for controlling the heating of said print head, said print head arranged in a recording medium feeding path defining a main scanning direction and an auxiliary scanning direction for printing, comprising:

a heat generating resistor unit having a plurality of heat generating elements arranged adjacent to each other and forming a line, and

a plurality of such lines of said heat generating elements arrayed orthogonal with the auxiliary scanning direction of said heat with the elements of one line aligned with the elements of a second line, wherein printing of two lines orthogonal with said auxiliary scanning direction occurs for each advance of said recording medium in said auxiliary scanning direction.

4,428,691

DOT MATRIX PRINTER HEAD

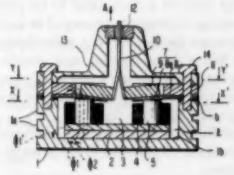
Osamu Suzuki, and Keiji Nakamura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,410

Claims priority, application Japan, Sep. 11, 1980, 55-126248

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **1 Claim**



1. A print head for a dot matrix printer comprising:

a cup-shaped cylindrical casing means (1) having a flat circular bottom wall (16) and a cylindrical side wall (1a) made of magnetically permeable material;

a disc-shaped permanent magnet (2) having a diameter smaller than an inner diameter of said bottom wall, said magnet being axially magnetized and mounted coaxially on said bottom wall and being surrounded by said side wall;

a disc-shaped plate (3) having a diameter substantially equal to said permanent magnet and forming an annular gap between itself and said cylindrical side wall, said plate being made of magnetically permeable material and allow-

ing a leakage of a portion of a magnetic flux from said magnet through said air gap into said side wall;

a plurality of electromagnetic elements (5) mounted perpendicularly on the surface of said plate, said electromagnetic elements being circumferentially spaced from one another and each being made of a post of magnetically permeable material;

a coil (4) wound on each of said electromagnetic elements; and

a plurality of hammers (7, 8, 8a, 9, 10) equal in number to said electromagnetic elements, said hammers having a disc (8) fixed to an open end of said cylindrical side wall and formed of a resilient magnetically permeable material and a plurality of tongues (8a) extending inwardly from said disc so that each of said tongues overlies each electromagnetic element to form one of said hammers and a magnetic flux path between said magnet and its associated electromagnetic element, said tongues being attracted on the tips of said respective posts under the influence of said magnetic flux so long as said coils remain unenergized, said hammers further having a plurality of print wires (10) respectively secured onto tips of said tongues.

4,428,692

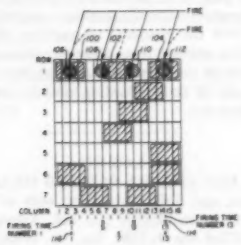
HIGH SPEED IMPACT MATRIX PRINTER

Jack W. Cannon, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 164,257, Jun. 30, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,792

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **9 Claims**



1. An arrangement for printing characters in a matrix printer, comprising:

means for relatively moving a print mechanism along successive print lines of a document to be printed, said print lines comprising characters arranged in accordance with a matrix character format having a predetermined number of possible firing times therein, said matrix character format having a predetermined number of rows and columns, none of said rows overlap another row and none of said columns overlap another column;

storage means for storing character configuration information of individual characters to be printed in said successive print lines;

means for providing print firing signals to said print mechanism, said print firing signals being derived from the character configuration information stored in said storage means, and said print firing means being operable in timed relation with relative movement of said print mechanism along said successive print lines to supply firing signals as required; and

at least one print element in said print mechanism, said print element comprising an elongated impact member, said impact member having an impact surface with an elongated cross-sectional area, said impact surface having its longitudinal dimension extending in the same direction as the direction of relative movement of said print mechanism along said successive print lines and said longitudinal dimension exceeding the lateral dimension of said impact surface area normal to the direction of movement of said print mechanism along said print lines, said longitudinal dimension of said impact surface area extending over a plurality of said columns, said lateral dimension of said impact surface area being approximately equal to the lateral dimension of one of said rows and said print firing signals means being operable to print a character having no overlapping imprints from said impact surface areas of said print element, whereby the number of print firing signals required to be applied to said print mechanism in order to effect formation of said individual characters during printing operations is less than that required with print elements having impact members of uniform cross-sectional impact surface area.

4,428,693

SERIAL DOT PRINTER FOR OFFICE MACHINES

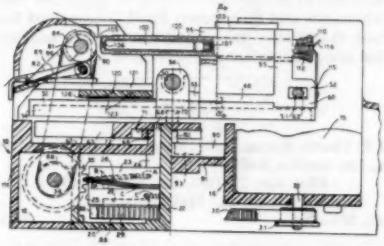
Michele Bovio, Brosso; Lino Sella, Banchette; Pierangelo Berruti, Chivasso; Walter Gillone, Ivrea, and Luciano Ceresa, Albiano, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Division of Ser. No. 245,528, Mar. 19, 1981, abandoned. This application Dec. 7, 1981, Ser. No. 328,257

Claims priority, application Italy, Mar. 20, 1980, 67417 A/80; Feb. 2, 1981, 67134 A/81

Int. Cl.³ B41J *3/02, 25/30*; G01D *15/18*

U.S. Cl. 400—126 **8 Claims**



1. A serial dot printer for printing dots in a series of printing positions on a printing support along a printing line, comprising a carriage movable relative to said printing support and having a rectilinear guide perpendicular to the direction of carriage movement, at least one printing head selectively actuatable and mounted on said carriage, a driving member rotatable about a shaft perpendicular to said direction and to said guide for moving said carriage, said driving member including an eccentric element fixed thereon and engaged with said guide for moving said carriage with simple harmonic motion along the entire length of said printing line.

4,428,694

ROTARY PRINTING DEVICE WITH IDENTIFYING MEANS AND METHOD AND APPARATUS FOR IN SITU IDENTIFICATION

Robert A. Ragen, Hayward, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 233,538, Feb. 11, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,114

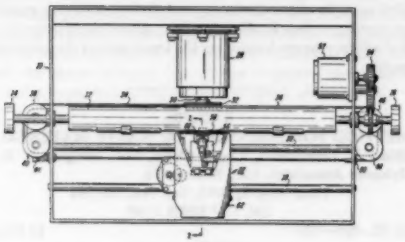
Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **22 Claims**

1. A rotary printing device for an impact printer; said printer including a rotatable drive shaft for supporting said printing device for rotation about its axis and interposer means for relative movement into and out of interfering relationship with said printing device; said printing device including a central hub, mounting means on said hub for securing said printing

device to said drive shaft, and a plurality of spokes, extending outwardly from said central hub, terminating in character pads, said printing device being characterized by comprising

first and second blocking means, extending axially outwardly from said hub, for contacting said interposer means when said interposer means is positioned in interfering relationship with said printing device, said blocking means subtending an identification angle therebetween, about the axis of said printing device, said identification angle being selected to uniquely identify the characteristics of said printing device and to distinguish said printing device from others having different characteristics.

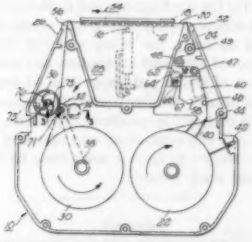


4,428,695

CARTRIDGE WITH SELF ADJUSTING PRESSURE ROLLER AND END OF RIBBON DETECTION MEANS

John W. Jamieson, Alamo, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed May 12, 1982, Ser. No. 377,423
Int. Cl.³ B41J *35/36*
U.S. Cl. 400—249 **1 Claim**



1. A ribbon cartridge for use in printing devices of the type having mounted thereon either a first light source for emitting a first light beam and an associated first light sensor for detecting an end of ribbon condition, or a second light source for emitting a second light beam and an associated second light sensor for detecting an end of ribbon condition, said ribbon cartridge comprising:

a housing;

an inked ribbon having a reflective end surface;

transport means including first and second spools within said housing for transporting said ribbon in a vertical orientation;

first and second openings in the bottom of said housing and positioned so that said first or said second light source and said first or said second sensor may extend through one of said openings into said housing as the ribbon cartridge is mounted in a printing device; and,

a mirror positioned within said housing in a position to intercept said first light beam from said first light source extending into said housing through one of said openings and reflect said first light beam onto said ribbon, said reflected light beam being again reflected from the reflective end surface of said ribbon to said mirror and then to said first light sensor;

said transport means including means for transporting said inked ribbon along a path which intercepts either said second light beam emitted by said second light source extending into said housing through a first of said openings and reflects said second light beam to said second sensor or intercepts said first light beam emitted by said first light source extending into said housing through a second of said openings after said first light beam has been reflected by said mirror and reflects said first light beam back to said mirror;

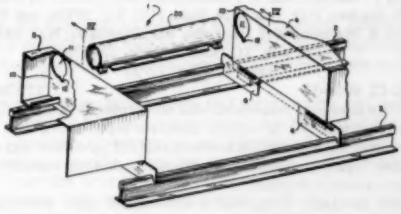
whereby said ribbon cartridge may be utilized in printing devices having light sources and sensors mounted at either one of two positions thereon.

4,428,696

CONDUIT CONNECTORS FOR LIGHTING SYSTEMS

Edison A. Price, New York, N.Y., assignor to Edison Price, Incorporated, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,349
Int. Cl.³ F16B *7/08, 9/00*
U.S. Cl. 403—168 **12 Claims**



1. In a lighting systems having at least two lighting fixtures each including end plates and at least one rigid conduit connector therebetween, the improvement wherein:

each end plate has an opening forming at least one alignable key hole therein having a substantially circular spiral circumference; and a tube having a substantially circular open spiral surface longitudinally slidably received in each key hole in one given angular orientation, and to providing a friction-tight fit in the key hole in response to rotation of the tube around its longitudinal axis in one direction from said one given angular orientation.

4,428,697

DEVICE ADAPTED FOR CLAMPING TO A ROTATABLE SHAFT

Frederick F. Ruland, Weston, Mass., assignor to Ruland Manufacturing Company, Inc., Watertown, Mass.

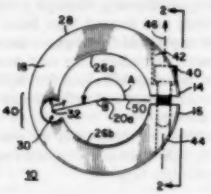
Filed Jun. 8, 1981, Ser. No. 271,568
Int. Cl.³ F16D *10/6*
U.S. Cl. 403—344 **1 Claim**

1. A device adapted for clamping to a rotatable shaft having radius R, comprising:

A. an elongated member having two end portions and an intermediate portion between said end portions, said elongated member being C-shaped about a central axis and having an outer surface and an inner surface, and said intermediate portion including a flexure-defining and balancing (FD/B) hole, interrupting and extending radially outward from said inner surface, thereby establishing a flexure region in said intermediate portion, said FD/B hole including a cylindrical portion having a hole axis parallel to said central axis and

B. a screw means for selectively biasing said end portions toward each other whereby the radius of said inner surface about said central axis equals R,

wherein said cylindrical portion of the FD/B hole has a predetermined radius and has its hole axis angularly offset about said central axis with respect to a center line passing through said central axis and midway between said end portions, and



wherein said cylindrical hole has its hole axis radially offset with respect to the mean radius of said device when the radius of said inner surface equals R, whereby said device is substantially balanced about said central axis.

4,428,698

GEOTEXTILE FOR PAVEMENT OVERLAYS

Jerry C. Murphy, Rte. 8, Pinedell, Monroe, N.C. 28110; Ronald E. Sanders, P.O. Box 3624, Rock Hill, S.C. 29730, and Warren S. Harmon, 6610 Ironkettle Rd., Matthews, N.C. 28105

Filed Aug. 21, 1980, Ser. No. 179,578
Int. Cl.³ E01C *11/18*
U.S. Cl. 404—17 **12 Claims**

1. An improved resurfaced road comprising (a) a crack-filled old pavement; (b) an asphalt concrete layer above said old pavement; (c) a geotextile between said old pavement and said asphalt layer, for preventing reflective cracking wherein the improvement comprises:

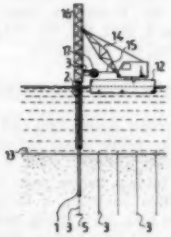
said geotextile comprises a core-bulked yarn interwoven with tape fabric firmly embedded between and contacting said old pavement and said asphalt concrete layer, wherein said core-bulked yarn comprises two sets of filaments, said first set being straight to give dimensional stability and forms a core around and through which said second set of filaments is entangled in coils or loops.

4,428,699

PROCEDURE AND MEANS FOR PROVIDING A VERTICAL DRAIN IN THE BOTTOM OF A WATER BODY

Mauno O. Juhola, Lounaisväylä 2, 00200 Helsinki 20, Finland

Filed Dec. 8, 1982, Ser. No. 447,931
Claims priority, application Finland, Dec. 17, 1981, 814072
Int. Cl.³ E02D *3/10*; E21B *19/00*
U.S. Cl. 405—50 **8 Claims**



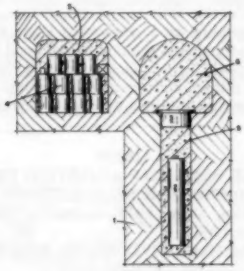
1. Improvement in a procedure for making a vertical drain in the bottom of a water body such as a sea or lake from a raft on the surface of the water body, wherein a conveying member, carried on the raft movably in vertical direction, is brought to be close to the bottom of the water body, a push tube supported by the conveying member movably in vertical direction is pushed into the soil layer on the bottom of the water body to desired depth, whereby the push tube carries along a prefabricated drain, provided with an anchor at its lower end, whereafter the push tube is pulled up, while the prefabricated drain remains in its place in the soil layer with the aid of the anchor, wherein the improvement comprises that the push tube is pulled up to be above the lower end of the conveying member, that another anchor is affixed to the prefabricated drain by the aid of a fixing means located on the lower end of the conveying member.

4,428,700

METHOD FOR DISPOSING OF WASTE MATERIALS

William L. Lennemann, Chevy Chase, Md., assignor to E. R. Johnson Associates, Inc., Reston, Va.

Filed Aug. 3, 1981, Ser. No. 289,784
Int. Cl.³ B09B *1/00*
U.S. Cl. 405—128 **19 Claims**



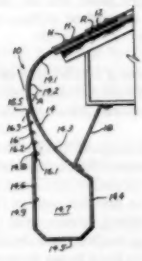
1. A method for the confinement and isolation of toxic waste material which comprises depositing said waste material in an excavation and encasing the waste material with a molten composition poured into said excavation and comprising the reaction product of sulfur and about 2 to 40 weight percent based on the sulfur of a modifier or modifiers selected from the group consisting of dicyclopentadiene, dipentene, vinyltoluene and oligomers of cyclopentadiene and allowing said molten composition to harden to form a solid mass having incorporated therein said waste material.

4,428,701

NON-CLOGGING EAVES TROUGH

Gifford R. Duffy, 2051 - 211th Ave. N.E., Redmond, Wash. 98052

Filed Sep. 21, 1981, Ser. No. 303,829
Int. Cl.³ E02B *9/04*; E04D *13/00*
U.S. Cl. 405—119 **9 Claims**



1. A non-clogging eaves trough comprising an elongated

sheet formed with a flange attachable to a building, a continuous smoothly curved portion extending from the flange outwardly and downwardly and then downwardly and inwardly with respect to the vertical, a generally upwardly open trough section carried by and below the curved portion, the curved portion having an outermost reach extending outwardly of and overhanging the outermost extent of the trough section, and a generally vertical screen extending between the trough section and the smoothly curved portion and making a sharp angle with the latter portion, the screen engaging the smoothly curved portion below the outermost reach of the latter.

4,428,702

SLIDING TENSION LEG TOWER WITH PILE BASE

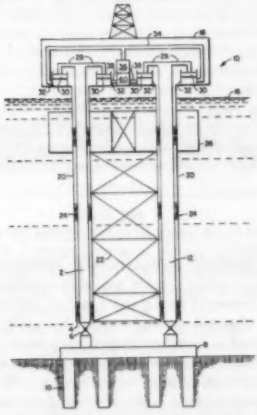
Barry J. Abbott, Concord, and William H. Silcox, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 19, 1981, Ser. No. 275,541

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—202 **7 Claims**



1. An offshore drilling and producing structure, which comprises:

a rigid platform including equipment associated therewith;

a plurality of open-ended sleeves affixed to the platform and extending downwardly therefrom for a substantial distance below a water surface, in a substantially vertical orientation;

an equal plurality of axial piles secured by articulated joints to a pile base on the sea floor, which axial piles extend upwardly into said open-ended sleeves to at least a position near the surface of the water;

buoyant means affixed to said sleeves below the water surface for providing an upward buoyant force in excess of the weight of said platform including equipment associated therewith and said sleeves; and

means for counterbalancing the excess buoyant force from the plurality of axial piles, said means permitting simultaneous vertical movement of each of said sleeves with respect to each of said piles to permit a desired degree of compliancy of rotation about the sea floor.

4,428,703

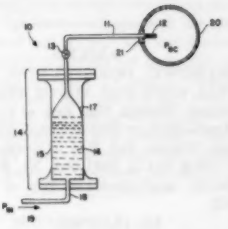
POWDER FED SHEARED DISPERSAL PARTICLE GENERATOR

E. Leon Morrisette, Newport News, and Dennis M. Bushnell, Hayes, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,488

Int. Cl.³ B65G *53/02*; G01M *9/00*

U.S. Cl. 406—155 **10 Claims**



1. An apparatus to supply a cloud of uniform, submicron-sized particles to a high pressure environment, comprising:

feeding system means for storing and supplying the desired particles;

conduit means for accepting said particles from said feeding system means, said conduit means having microslits on its periphery for separating and injecting said particles;

settling chamber means for receiving the injection of said particles from said conduit means; and

carrying fluid means for transporting said particles wherein said carrying fluid means is supplied at a pressure sufficient to cause said microslits to operate at choked flow.

4,428,704

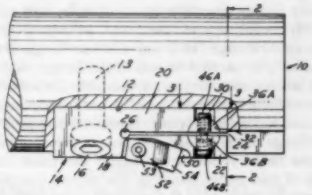
MICRO-ADJUSTING CARTRIDGE FOR CUTTING TOOL

Shivdas Kalokhe, Clinton, Canada, assignor to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 172,731, Jul. 28, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 408,306

Int. Cl.³ B23B *29/00*

U.S. Cl. 408—156 **2 Claims**



1. A boring tool with an adjustable cutting diameter, comprising a boring bar having a long axis and an outwardly facing, open recess extending along the long axis and a tool cartridge mounted in said recess, said cartridge having a bight portion with means for mounting the cartridge in said recess, a pair of legs extending from said bight portion in spaced apart, substantially parallel relation with each other and the long axis in said recess with an inner leg abutted against the boring bar and an outer leg carrying cutting means for cutting engagement with a workpiece and being resiliently movable relative to said inner leg, said legs each having transverse threaded bore means in axial alignment, with the threaded bore means of

one leg having different pitch threads from the threaded bore means of the other leg, said cartridge further comprising transverse screw means threadably received in the threaded bore means connecting said legs and having an inner end terminating in said inner leg short of said boring bar so as to be out of contact therewith with the screw means having different pitch threads adjacent opposite ends corresponding with those of the respective threaded bore means such that rotation of said screw means moves said outer leg and cutting means thereon relative to said inner leg to adjust cutting diameter without said screw means having to engage the boring bar for such adjustment.

4,428,705

SPREADING DOWEL FOR SECURING AN INSERT IN A PANEL WITH THE AID OF THE DOWEL

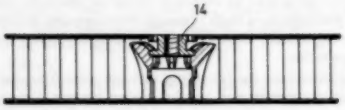
Manfred Gelhard, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,141

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042432

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—82 **6 Claims**



1. In a device for securing fastener means having a central longitudinal axis in a hole of a sandwich type panel having two parallel outer surfaces, wherein the device includes a first component having spreadable elements and a second component having an inner threading, said second component spreading the spreadable elements of said first component when the second component is pressed into the first component, the improvement wherein said first component comprises a lower portion (**12**) to be inserted first into the hole of a sandwich type panel and an upper portion (**13**) comprising a plurality of said spreadable elements separated by slots, hinging means (**13e**) flexibly hinging said spreadable elements to said lower portion so that said spreadable elements extend somewhat radially outwardly relative to said central longitudinal axis prior to insertion into said hole, said hinging means being sufficiently yielding so that the spreadable elements are moved radially inwardly during insertion into said hole, said second component (**14**) comprising an insert with an internal threading having an upper flange (**14b**) and a lower flange (**14c**) extending substantially in parallel to said upper flange, said lower flange of said insert contacting said spreadable elements for spreading the spreadable elements radially outwardly inside said hole when said second component is pressed into said hole with the lower flange of the second component pressing said spreadable elements radially outwardly inside the panel until an outer surface of said upper flange of the second component extends substantially level with the adjacent outer panel surface.

4,428,706

INTERLOCK SELECTOR CONTROL VALVE FOR ROUND BALE WAGON

L. Dennis Butler, Kingsburg, and Alan R. Askov, Fresno, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

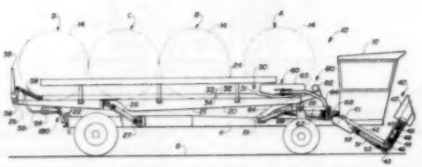
Filed Jun. 23, 1981, Ser. No. 276,571

Int. Cl.³ A01D *87/12*; F15C *3/02*

U.S. Cl. 414—24.5 **6 Claims**

1. In a bale wagon for picking up bales of crop material from the field, accumulating a plurality of bales and transporting the accumulated bales to a preselected storage location to be unloaded from the bale wagon, said bale wagon having a mobile frame adapted for movement across the field; a bale pickup means mounted on said frame for individually engaging bales of crop material on the ground and elevating said bales onto the bale wagon; a load bed pivotally mounted on said frame for accumulating a plurality of said bales, said load bed being pivotable relative to said main frame to raise the forward end thereof and effect an unloading of the accumulated bales; cross conveyor means mounted on said frame for conveying bales elevated onto said load bed by said pickup means, said cross conveyor means being at least partially operable over said load bed; pusher advance means mounted on said frame adjacent said load bed to position bales on said load bed, said cross conveyor means and said pusher advance means alternately operating to arrange and position bales deposited onto said load bed by said bale pickup means in a preselected manner; a hydraulic system including a first hydraulic cylinder for operatively driving said bale pickup means; a second hydraulic cylinder for operatively driving said cross conveyor means, a third hydraulic cylinder for operatively driving said pusher advance means, a fourth hydraulic cylinder for pivoting said load bed relative to said mobile frame, a plurality of control valves for controlling the flow of hydraulic fluid to said hydraulic cylinders and conduit means interconnecting the hydraulic cylinders and control valves for transporting the flow of hydraulic fluid therebetween; and power means for operatively powering said hydraulic system, the improvement comprising:

an interlock selector valve connected to said hydraulic system in operative communication with said second and



third hydraulic cylinders, said interlock selector valve having a spool therein movably positionable between a cross conveyor mode and a pusher mode, hydraulic fluid being directed to said second hydraulic cylinder when said spool is in said cross conveyor mode and to said third hydraulic cylinder when said spool is in said pusher mode, said interlock selector valve having a flow path through said spool when in said pusher mode for directing hydraulic fluid to said fourth hydraulic cylinder only under conditions where said cross conveyor means and said bale pickup means are in a position that would not interfere with the pivoting of said load bed to raise the forward end thereof relative to said frame;

a first control valve in operative communication with said interlock selector valve and with said fourth hydraulic cylinder to control the flow of hydraulic fluid thereto for operation thereof to pivot said load bed relative to said frame; and

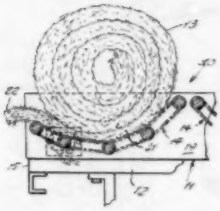
a second control valve in operative communication with said first hydraulic cylinder to control the flow of hydraulic fluid thereto for operation of said bale pickup means to elevate said bales onto said load bed, said second control valve having a spool selectively movable in three positions, including a neutral position in which hydraulic fluid is not directed to said first hydraulic cylinder, said first and second control valves being in operative communication such that hydraulic fluid must pass through said second control valve before entering said first control valve.

4,428,707

ROUND BALE FEEDER

Richard A. Cockle, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o Richard A. Cockle, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 20, 1981, Ser. No. 323,661
Int. Cl.³ B65H *51/08, 49/24*
U.S. Cl. 414—24.6 2 Claims



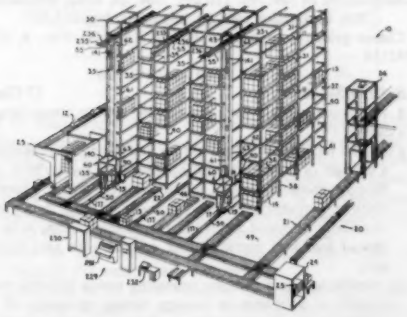
1. A round bale feeder for unrolling hay bales when being discharged from a hay transporting vehicle, comprising in combination a frame, a mechanism in each end of said frame including a plurality of rollers affixed on rotatably driven shafts, parallel to each other and spaced apart at rising elevations from center to the endmost of the rollers to form a depression upon which said hay bales are rested while being unrolled, each of said rollers having means to spread said bales laterally while being unrolled wherein a gear on each said shaft is engaged by an endless belt driven by power from a motor in combination with other endless belts interconnecting at the gears of adjacent rollers, said means on the rollers to spread said bales laterally comprise a plurality of cleats which taper from a greater center height to a smaller height at each of the roller's ends, said cleats extending along the periphery of the roller surface and being parallel to the axis of the roller.

4,428,708

APPARATUS AND METHOD FOR FINE POSITIONING A VEHICLE AT A STORAGE BIN IN AN AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

Harold S. Burt, Kansas City, Kans., assignor to Midwest Conveyor Co., Inc., Kansas City, Kans.

Filed Dec. 31, 1980, Ser. No. 221,792
Int. Cl.³ B65G *1/00*
U.S. Cl. 414—275 9 Claims



1. A system for positioning a carriage movably mounted on a vehicle at a predetermined storage bin in one of a bin high position and a bin low position, which comprises:

(a) energy source means and energy sensing means mounted on one of said carriage and said vehicle;

(b) a discrete energy reflective bin high target mounted on the other of said carriage and said vehicle;

(c) a discrete energy reflective bin low target mounted on said other of said carriage and said vehicle;

(d) a discrete energy reflective bin safe target mounted on said other of said carriage and said vehicle;

(e) said carriage having a laterally extendable fork;

(f) said energy sensing means being adapted to receive energy from said energy source means reflected by said targets;

(g) control means operably connected to said energy sensing means for causing said carriage to move to one of said bin high and said bin low positions and for stopping said carriage in one of said bin high and said bin low positions at said predetermined storage bin upon said energy sensing means being actuated by energy reflected from a respective one of said bin high and said bin low targets;

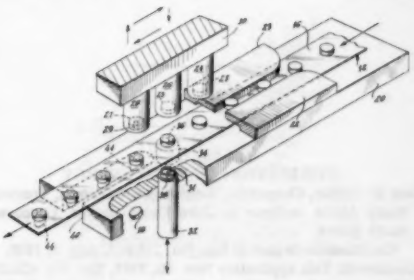
(h) said control means preventing vertical movement of said carriage with said fork thereof laterally extended except when said energy sensing means receives energy from said energy source reflected from said bin safe target.

4,428,709

DE-PACKAGING APPARATUS

Alan R. Peters, Stratford, Conn., assignor to Automation International Corp., Norwalk, Conn.

Filed Nov. 28, 1980, Ser. No. 211,034
Int. Cl.³ B65B *69/00*
U.S. Cl. 414—412 13 Claims



1. Apparatus for removing the contents from a packaging container comprising

blanking means for blanking the outline of an egress hole in one of the walls of said container,

and removal means for removing the contents of said container by impinging upon the exterior of the wall of said container that is opposite the wall in which said egress hole outline has been blanked, and for causing the wall so impinged upon to buckle inward and to push the contents from said container through said egress hole.

4,428,710

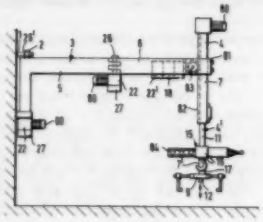
MANIPULATOR WITH A SWIVEL JIB

Hans T. Grisebach, Kampstrasse 7, 4750 Unna; Rudolf Betzing, Vogelherd 3, 5800 Hagen; Volker Betzing, Vogelherd 3, 5800 Hagen; Ulrich Betzing, Vogelherd 3, 5800 Hagen, and Klaus Betzing, Vogelherd 3, 5800 Hagen, all of Fed. Rep. of Germany

Continuation of Ser. No. 943,489, Sep. 18, 1978, abandoned. This application Nov. 24, 1980, Ser. No. 209,482
Int. Cl.³ B25J *11/00*; F16H *25/20*
U.S. Cl. 414—590 9 Claims

1. A manipulator comprising a jib adjustable about a vertical axis, an extensible elongate support unit carried on the jib, the support unit extending vertically downwards relative to the jib, and a load holding unit carried by the lower end of the support unit, the support unit including a housing, a guide, a

screw-threaded spindle, means for selectively driving the spindle in rotation, a non-rotatable ball sleeve associated with the spindle, a support plunger operatively connected with the ball sleeve whereby the plunger is adjustable vertically in response to rotation of the spindle, a bearing element detachably mounted on the plunger at its lower end, said bearing element having at least one mounting face, a spacing element secured to



said mounting face, the load holding unit connected to the spacing element, said spacing element being adapted to permit swivelling movement of the load holding unit relative to the bearing element and to clamp the same in position, wherein said support unit is secured against angular movement relative to the jib and the housing thereof is adjustable in the vertical sense relative to said jib.

4,428,711

UTILIZATION OF WIND ENERGY

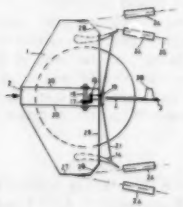
John D. Archer, Coopersdal, Komatiepoort District, Transvaal, South Africa, assignor to John David Archer, Coopersdal, South Africa

Continuation-in-part of Ser. No. 174,619, Aug. 1, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,386

Claims priority, application South Africa, Aug. 7, 1979, 79/4077

Int. Cl.³ F03D *1/04*

U.S. Cl. 415—2 A **23 Claims**



1. A wind energy device comprising a first airfoil having a major axis, a leading edge, a trailing edge, and a tip, the first airfoil being supported above a surface and being adapted, when traversed by a prevailing wind, to generate a vortex at its tip, means to vary the orientation of the airfoil relative to the prevailing wind, and a rotary device located in the path of the vortex and adapted to be driven by the wind in the vortex, including a second airfoil having a major axis generally transverse to the major axis of the first airfoil and arrranged so that its downwash effect augments the energy of the vortex.

4,428,712

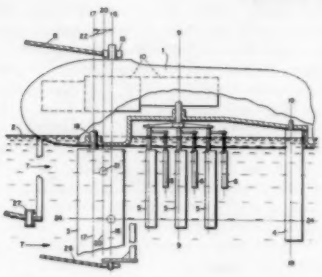
CAPTIVE WATER CURRENT POWER SYSTEM

Hans F. Wuenscher, late of Huntsville, Ala., and Hertha A. Wuenscher, Administratrix, 2004 Dogwood La., Huntsville, Ala. 35810

Filed Nov. 12, 1980, Ser. No. 206,185

Int. Cl.³ F01D *25/28*

U.S. Cl. 415—7 **8 Claims**



1. A captive water current energy conversion power system, comprising: at least one power unit, each comprising a buoyant body structure, a plurality of hydrofoil wings extending downwardly into said water current and being pivotally mounted on said body structure to permit readjustment of their angle of attack, said hydrofoil wings capturing said water currents, and producing aerodynamic lift forces to propel said body structure and water current at a higher relative speed, at least one second set of hydrofoil wing system rotatably mounted on said body structure at a position rearwardly of said plurality of wings and being exposed to said higher speed current, power generating machinery mounted on said body structure and being attached to said second set of wing system where by the energy held by the current is converted to revolving motion of said power generating machinery, mooring means attached to said body structure and an anchor structure to effect said captive path of said body structure through said water current, and control means for effecting the angle of attack adjustment of said plurality of hydrofoil wings.

4,428,713

TURBINE

John F. Coplin, and Edward S. Hadaway, both of Duffield, England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 210,259, Nov. 25, 1980, abandoned. This application Feb. 10, 1983, Ser. No. 465,457

Claims priority, application United Kingdom, Dec. 6, 1979, 7942156

Int. Cl.³ F01D *25/12, 25/16*

U.S. Cl. 415—48 **17 Claims**

1. A turbine suitable for a gas turbine engine comprising:

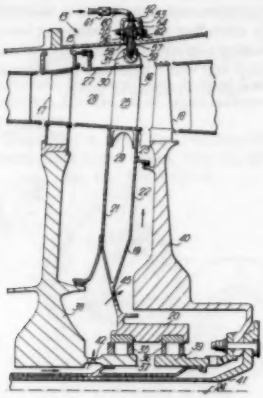
a casing;

a support member enclosed within said casing and capable of a change in tension during operation of the turbine, said support member having a hub portion and a generally circular periphery, and said support member being symmetrically disposed about the axis of said turbine with the axis of said hub portion being coaxial with said turbine axis;

an annular array of radially extending stator aerofoil vanes capable of a change in tension during operation of the turbine, each of said stator aerofoil vanes being attached to both said casing and the periphery of said support member; and

tension maintenance means directly connected to at least one of said support member and said stator aerofoil vanes, said tension maintenance means comprises tensioning means

for varying the tension in said support member and said stator aerofoil vanes, tension monitoring means for monitoring the degree of tension in each of said support member and said stator aerofoil vanes, and control means operatively associated with said tensioning means and



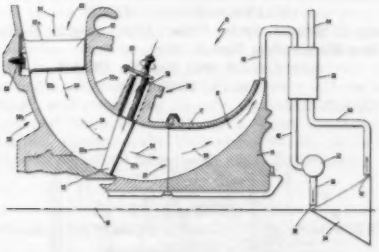
responsive to said tension monitoring means, said control means being arranged to control said tension varying means in such a manner as to maintain said support member and said stator aerofoil vanes in a substantially constant state of tension during operation of the turbine.

4,428,714

PRE-SWIRL INLET GUIDE VANES FOR COMPRESSOR

Rolf J. Mowill, Oslo, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed Aug. 18, 1981, Ser. No. 293,869
Int. Cl.³ F01D *17/16*
U.S. Cl. 415—161 **20 Claims**



1. In rotary apparatus for compressing a compressible fluid of the kind having a plurality of compressor blades mounted on a rotating hub positioned in a compressor housing, a preferred fluid flow path extending through the housing, the housing having a duct portion extending upstream of the compressor blades relative to the fluid flow path and determining, in part, the fluid flow path, the improvement comprising:

means for controllably varying the fluid mass flow rate through the compressor including:

(a) a first set of guide vanes in the duct for imparting an initial degree of swirl to the fluid entering the duct relative to the axis and direction of rotation of the compressor hub; and

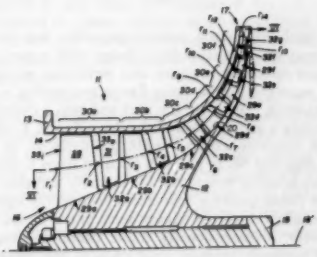
(b) a second set of guide vanes positioned in the duct upstream of the compressor blades, the vanes of the said second set being moveable about their axes, said second vane set being positioned a distance downstream of said first vane set along the preferred fluid flow path wherein at least about one first vane chord length separates the trailing edges of said first vane set from the leading edges of said second, moveable vane set, to permit substantial decay of the turbulence imparted to the flowing fluid by said first vane set prior to said swirling fluid reaching said second, moveable vane set, said second, moveable vane set for changing the degree of swirl in the fluid to a final degree of swirl incident upon the compressor blades corresponding to a desired compressor fluid mass flow rate.

4,428,715

MULTI-STAGE CENTRIFUGAL COMPRESSOR

Jesse O. Wiggins, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 91,679, Jul. 2, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,718
Int. Cl.³ F01D *1/06*
U.S. Cl. 415—199.2 **8 Claims**



8. A centrifugal compressor (11) comprising:

an annular stator (13),

an impeller (12) positioned for rotation in said stator (13) and being radially spaced therefrom by an annular air flow path (14) which has an air inlet end (16) and an air outlet end (17) of larger diameter and which has a curved portion (20) of progressively increasing outward curvature which extends from said air inlet end (16) to said air outlet end (17),

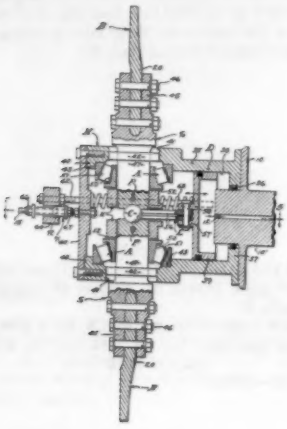
a series of compressor blade rows (29) located in said curved portion (20) of said flow path (14) and being connected to said impeller (12) and a series of diffuser blade rows (32) located in said curved portion of said flow path and being connected to said stator (13), said diffuser blade rows (32) being alternated with said compressor blade rows (29) along said flow path (14), each of said compressor blade rows (29) in conjunction with an adjacent one of said diffuser blade rows (32) constituting one of a series of compression-diffusion stages (30) in said curved portion of said flow path (14), and

each of said blade rows (29,32) of all of said compression-diffusion stages (30) having blade means (28,31) for providing a calculated design point diffusion factor below about 0.55 and a de Haller number greater than about 0.70, and (32) having a mean radius which increases in the range of from about 2% to about 15% between the inlet side (35*i*) and the outlet side (35*o*) thereof.

4,428,716
VARIABLE PITCH PROPELLER HUB WITH FLUID MOTOR ACTUATING MEANS

Ralph P. Maloof, 4527 Park Monaco, Calabasa, Calif. 91302

Continuation of Ser. No. 805,283, Jun. 10, 1977, Pat. No. 4,202,655. This application Apr. 28, 1980, Ser. No. 144,390
Int. Cl.³ F04D *29/36*
U.S. Cl. 416—157 R 13 Claims



1. A feathering pitch control propeller hub for coupled engagement with an axial drive flange with a port supplying fluid under operating pressure, and including; an integral hub housing securable to the drive flange and having a static seal communicating fluid from the port and into a cylinder on the axis of rotation and forward of the drive flange, a piston sealed with and operable axially within the cylinder, at least two radially disposed blade journals opening from a chest portion of the hub housing forward of the cylinder and piston, propeller blade stems entering said chest portion through bearings thrust radially outwardly against seats in the journal openings respectively, a dimensionally stable center bearing member disposed between opposed inner ends of the propeller blade stems, a lever-nut affixed to the inner end of each stem and positioned to thrust outwardly against the bearings, a link extending rearwardly from each nut and connected to the piston for pitch control, a shim disposed between at least one of said lever-nuts and a bearing to maintain a pre-load against said bearings, and spring means biasing the piston rearwardly against said fluid in the cylinder to rotate the stems toward a blade feathering position, said fluid under operating pressure actuating the piston to rotate the stems toward a blade pitch position.

4,428,717
COMPOSITE CENTRIFUGAL IMPELLER FOR SLURRY PUMPS

Fritz C. Catterfeld, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

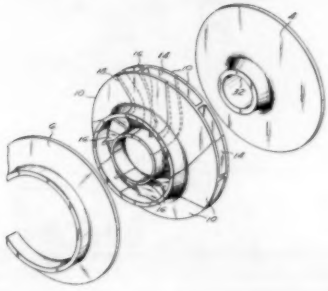
Continuation-in-part of Ser. No. 88,886, Oct. 29, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 303,739
Int. Cl.³ F04D *29/28*
U.S. Cl. 416—186 R 11 Claims

1. A composite impeller suitable for use in pumps handling hot, highly abrasive slurries and having a drive shaft, said impeller comprising:

a disk shaped backplate comprising an axial forwardly extending hub section and an axial opening extending through said hub for securing said backplate to said drive shaft, said backplate being constructed from material comparable in thermal expansion to said drive shaft;

a cover plate having a forwardly extending flange concentric to said hub, said cover plate being constructed from material comparable in thermal expansion to said drive shaft,

a radially segmented insert forming the working surfaces of said impeller sandwiched between said backplate and said cover plate, said segmented insert being constructed from high temperature and wear resistant material and having forwardly extending sections extending between and entirely covering said hub and said flange for matably engaging said hub and said flange and for protecting said hub and said flange from abrasive wear;

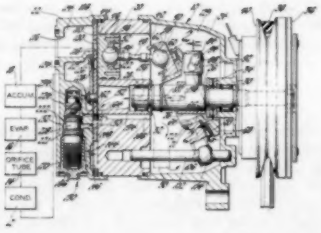


bonding material joining said insert to said backplate and said cover plate, said bonding material being constructed from brazing alloy which at the operating temperature of said pumps allows said insert to float between said backplate and said cover plate to accomodate the differences in thermal expansion between said backplate, said cover plate and said radially segmented insert, yet retains sufficient tensile strength to transmit driving torque to said radially segmented insert.

4,428,718
VARIABLE DISPLACEMENT COMPRESSOR CONTROL VALVE ARRANGEMENT

Timothy J. Skinner, Spring Valley, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1982, Ser. No. 352,225
Int. Cl.³ F04B *1/26*
U.S. Cl. 417—222 6 Claims



1. In a variable displacement compressor having compression chambers each with a suction valve for admitting fluid thereto from a suction cavity and a discharge valve for delivering the fluid to a discharge cavity wherein pressure is established and controlled in the compressor's crankcase relative to suction pressure to vary the displacement of the compression chambers by a passage between the discharge cavity and the crankcase and also a passage between the crankcase and the suction cavity: the improvement comprising displacement

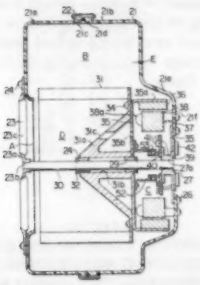
control valve means directly and separately communicating with and responsive to both the suction pressure and discharge pressure and operable on said passages so as to control the crankcase pressure relative to the suction pressure in a manner to increase the compressor displacement and thereby the discharge flow rate with increasing suction and discharge pressures.

4,428,719

BRUSHLESS MOTOR FAN

Toshio Hayashibara; Kunihiro Noto, both of Katsuta, and Yoshinori Fukasaku, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,275
Claims priority, application Japan, May 14, 1980, 55-62836
Int. Cl.³ F04B *35/04*
U.S. Cl. 417—354 **8 Claims**



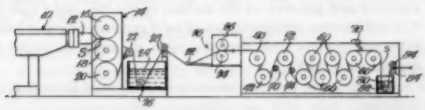
1. In a brushless motor fan unit of centrifugal type, comprising: a scroll casing having an inlet port, a scroll space and a compartment located on a side of said scroll space opposite said inlet port; a brushless motor accommodated in compartment and including a rotor, a stator concentric with said rotor and a shaft concentric with said rotor and having a front and a rear end; a centrifugal fan supported in said scroll space by said shaft and driven by said rotor, said centrifugal fan having a rear end part onto which a conical hub is concentrically attached, having an apex directing toward said inlet port; and a power unit for energizing said brushless motor, wherein the improvement comprises front means, positioned at said inlet port, for supporting said front end of said shaft and rear means, positioned in said compartment, for supporting said rear end of said shaft, said rotor being directly attached to a side of said rear end part that is opposite the side to which said conical hub is attached, concentrically therewith, and said stator being attached to said scroll casing with said compartment.

4,428,720

APPARATUS FOR PRODUCING POLYPROPYLENE SHEET

Donald L. Van Erden, Wildwood; Russell J. Gould, Mount Prospect, and Yukio A. Matsunaga, Chicago, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Division of Ser. No. 138,491, Apr. 22, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,501
Int. Cl.³ B29D *7/02*
U.S. Cl. 425—66 **8 Claims**



1. Apparatus for producing an abrasion resistant sheet from linearly crystalizable polypropylene material, said apparatus comprising:

(a) extrusion means for extruding a sheet of said material at a first temperature at which said material is rendered flowable;

(b) casting means including plural driven, heat transfer casting rolls for conveying said sheet in a forward direction and for forming said sheet, said casting means including means for maintaining said casting rolls at a temperature below said first temperature whereby said sheet is cooled to a second temperature below said first temperature;

(c) cooling means including a cooling bath for cooling said sheet to a third temperature below said second temperature;

(d) heated compression means including heated and driven compression rolls for maintaining said sheet at a fourth temperature, for compressing said sheet, and for causing flow of said material in said sheet in the forward direction so as to reduce the cross-sectional thickness of said sheet;

(e) tensioning means for placing said sheet under tension in the forward direction in conjunction with said compression rolls so as to cause orientation of the macromolecular chains in said material of said sheet as said sheet exits said compression rolls, said tensioning means including

(1) one or more chill rolls that are cooled so as to cool said sheet to a fifth temperature below said fourth temperature;

(2) one or more surface treatment rolls that are heated for reheating a surface of said sheet to a sixth temperature above said fifth temperature and between about 350 degrees F. and about 525 degrees F. for a time period sufficient to cause surface fusion to a depth between about 0.1 mil and about 3 mils but for a time period insufficient to cause fusion in the entire thickness of said sheet; and

(3) one or more stress relieving rolls heated to a seventh temperature below said sixth temperature so as to cause said sheet to reach a uniform temperature throughout its cross section for effecting stabilization of said sheet;

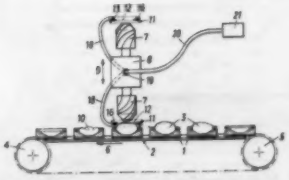
whereby the rolls of said tensioning means not only place said sheet under tension in conjunction with said compression rolls for effecting said orientation of the macromolecular chains, but also simultaneously effect said cooling of said sheet, said surface fusion of said sheet, and said stabilization of said sheet.

4,428,721

DOUGH MOLDING MACHINE

Helmut König, Usprungweg 70-72, A-8045 Graz, Austria

Filed Oct. 4, 1982, Ser. No. 432,624
Claims priority, application Austria, Oct. 2, 1981, 4237/81
Int. Cl.³ B29C *3/02, 3/06;* A21C *9/08*
U.S. Cl. 425—136 **12 Claims**



1. A dough molding or forming machine, having a drive means for at least one upwardly and downwardly movable molding or forming tool acting on a dough portion resting on a support, a normal expelling area on this support into which the dough portion is expelled during normal operation of said molding or forming tool, comprising at least one sensor means associated with a portion of said support which is located

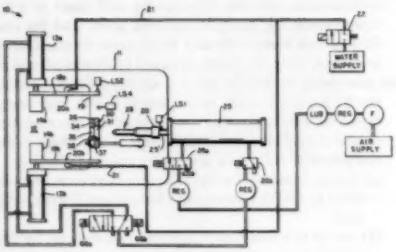
outside of said normal expelling area of the dough portion, said sensor means being able to sense dough expelled in an excessive amount by the downward movement of said forming or molding tool, and a signal means associated with said sensor means for creating a signal indicating said excessive amount of dough.

4,428,722

PIPE BELLING APPARATUS

Bruce A. Abbott, Rte. 2, Box 29, Henderson, Ky. 42420, and John M. Cohen, 6500 Newburgh Rd., Evansville, Ind. 47715

Filed Jun. 22, 1981, Ser. No. 275,989
Int. Cl.³ B29C *17/00*; B29D *23/00*
U.S. Cl. 425—150 **11 Claims**



1. In a pipe belling apparatus including mandrel means operable to enter an end of a pipe so as to form a belled socket at the pipe end, the improvement comprising in combination:

means operative to effect relative closing movement between said mandrel means and said pipe end;

first means disposed to be engaged by said mandrel means and moved therewith toward said pipe end;

said first means including sensing means operative to provide a signal in response to sensing said pipe end when said mandrel has entered a predetermined distance into said pipe end; and

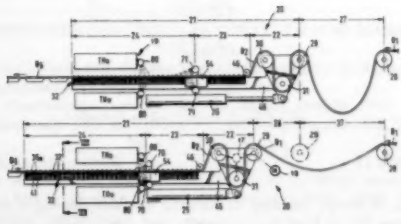
means responsive to said signal to discontinue said closing movement.

4,428,723

APPARATUS FOR STRETCHING A CONTINUOUSLY ADVANCING SYNTHETIC-RESIN WEB AND FEEDING SAME STEPWISE TO A THERMOFORMING MACHINE

Alfons W. Thiel, deceased, late of Mainz, Fed. Rep. of Germany, and by Erika Thiel, heiress, Uferstrasse 15, D-6500 Mainz, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,994
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—324.1 **25 Claims**



1. In combination with an input machine that continuously delivers a stretchable web to an upstream input location and with an output machine that operates stepwise to treat said web at a stationary downstream output location, a stretching apparatus comprising:

a reciprocal support frame between said locations and displaceable in an upstream direction toward said upstream loction and a downstream direction toward said downstream location;

stretch means carried on said frame and including web-engaging elements displaceable relative to said frame in said downstream direction for stretching said web and holding said web in stretched condition;

storage means between said frame and said upstream location for supporting at least the upstream end of a loop of said web therebetween;

drive means connected to said stretch means for continuously advancing the portion of said web engaged by said stretch means in said downstream direction relative to said frame at a web-travel rate; and

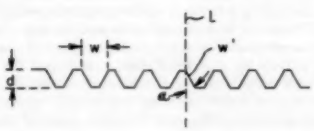
displacement means connected to said frame to move same when moving in said upstream direction substantially at said web-travel rate, whereby said web stops moving at said downstream location during such upstream movement of said frame.

4,428,724

MICROGROOVED PROCESSING ROLL AND METHOD FOR HEAT TREATING SHEET FILM USING SAME

Stanley B. Levy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1981, Ser. No. 306,734
Int. Cl.³ B29C *25/00*; B29D *7/20*
U.S. Cl. 425—446 **22 Claims**



1. An improved apparatus for heat transfer between a processing roll and sheets of organic thermoplastic crystallizable or crystalline polymeric film comprising a rotatably mounted processing roll, means for maintaining said roll at a temperature different from that of said film and means for contacting said film with said roll, the improvement which comprises 70 to 150 circumferential grooves per centimeter in the surface of the roll, the top width of said grooves on the surface of the roll being 0.04 to 0.13 millimeter and the depth of said grooves being at least 0.02 millimeter such that the ratio of depth to width is greater than 0.25.

16. A process for heat transfer between a processing roll and sheets of organic thermoplastic crystallizable or crystalline polymeric film comprising:

(i) providing a processing roll having 70 to 150 circumferential grooves per centimeter in the surface of the roll, the top width of said grooves on the surface of the roll being 0.04 to 0.13 millimeters and the depth of said grooves being at least 0.02 millimeters such that the ratio of depth to width is greater than 0.25;

(ii) maintaining the roll at a temperature different from that of said film

(iii) bringing the film to processing temperature by contacting of the film with the roll.

4,428,725
MOULD FOR MAKING ARTICLES OF EXPANDED PLASTICS MATERIAL AND MACHINE ADAPTED TO RECEIVE SUCH A MOULD

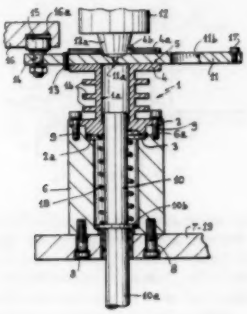
Pierre Babiol, Villefranche sur Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, S.N.B.P., Anse, France

Division of Ser. No. 315,074, Oct. 26, 1981. This application Sep. 14, 1982, Ser. No. 417,923

Claims priority, application France, Dec. 23, 1980, 80 27828

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—556 **5 Claims**



1. Moulding apparatus for making cylindrical stoppers for bottles, the apparatus comprising:

a mould having a cylindrical moulding cavity;

guide means attached to the mould at one end;

a closure plate transversely slidable in said guide means across said one end of the mould cavity, the plate having a plastic injection perforation therethrough aligning with the cavity in a first position of the plate in the guide means, and having a stopper ejection hole therethrough aligning with the cavity in a second position of the plate in the guide means;

a piston having one end entering and closing the other end of the cavity, and the piston being reciprocable longitudinally of the cavity to eject a moulded stopper when the plate is in said second position, said one end of the piston abutting the stopper being moulded and having a convex inner surface surrounded by an annular depression spaced from the periphery of the piston and shaped to provide a fillet rounding the end of the stopper as it approaches the mould cavity; and

the closure plate having a portion surrounding the perforation and abutting the stopper being moulded when the plate is in the first position, the portion being convex in the vicinity of the perforation and having an annular depression outsided the convex portion, and the annular depression curving toward the cavity to provide a fillet rounding the end of the stopper as it approaches the mould cavity.

4,428,726
BURNER APPARATUS

Nobuyuki Kimpara, Tenri; Hideki Kaneko, Ikoma, and Yoshifumi Moriya, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1981, Ser. No. 264,652

Claims priority, application Japan, Feb. 6, 1980, 55-74810; May 29, 1980, 55-72298

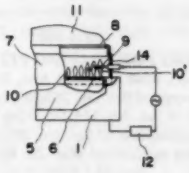
Int. Cl.³ F23N *5/00*

U.S. Cl. 431—78 **1 Claim**

1. A burner apparatus for use as a main burner for heating purpose comprising:

a main burner body comprising an inlet port disposed in opposed relation to a fuel injector for introducing fuel along with air, a diffuser portion arranged downstream from the inlet port for uniformly mixing the fuel and air, an equalizing portion arranged downstream from the diffuser portion for equalizing the pressure of the air-fuel mixture, and a primary flame forming portion having a plurality of slit-like primary flame holes in communication with the equalizing portion,

a primary combustion chamber provided, immediately above the primary flame holes, with a single secondary flame hole having a larger opening area than the total opening area of the primary flame holes,



a flame rod projecting into a primary flame or flames formed in the chamber through the primary flame forming portion,

the primary combustion chamber being provided with at least one auxiliary ventilation port adjacent the flame rod for supplying auxiliary air to a primary flame or flames formed adjacent the flame rod, and

a control circuit comprising a detecting portion for detecting the ion current through the rod and a control portion for controlling combustion in cooperating relation to the detecting portion.

4,428,727
BURNER FOR SOLID FUELS

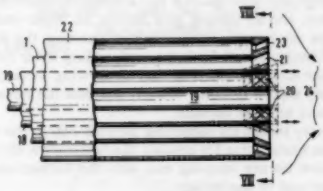
Herbert Deussner, Bergisch Gladbach; Horst Herchenbach, Hennef/Sieg Heisterschoss; Hubert Ramesohl, Bergisch Gladbach, and Wolfgang Breidenstein, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,986

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027587

Int. Cl.³ F23D *1/00*

U.S. Cl. 431—182 **2 Claims**



1. A burner for introducing a suspension of solid fuel particles into a combustion chamber which comprises:

a centrally disposed conduit,

an intermediate pipe surrounding said centrally disposed conduit and concentric therewith,

a plurality of swirl generating inserts disposed at the forward end of said burner between the inner wall of said intermediate pipe and the outer wall of said centrally disposed conduit, the spaces between said inserts providing a plurality of discharge openings between the outer wall of said centrally disposed conduit and the inside wall of said intermediate pipe,

a tubular conduit concentric with both said centrally disposed conduit and said intermediate pipe and surrounding the same,

a ring disposed at the forward end of said tubular conduit having an annular gap therein, and

an outer tube concentric with said centrally disposed conduit, said intermediate pipe and said tubular conduit, said outer tube having a plurality of spaced discharge openings thereabout circumscribing said ring,

said intermediate pipe being displaceable longitudinally along the axis of said outer tube to vary the discharge through said annular gap.

4,428,728

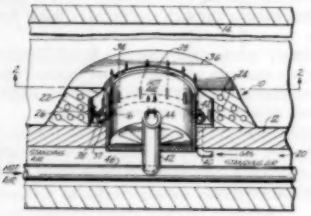
BURNERS FOR SOAKING PIT FURNACES

John Maksim, Jr., 8165 Cornwall Ave., Etiwanda, Calif. 91739

Continuation-in-part of Ser. No. 293,387, Aug. 17, 1981, which is a continuation of Ser. No. 146,469, May 5, 1980, abandoned, which is a continuation of Ser. No. 850,235, Nov. 10, 1977, abandoned. This application Mar. 22, 1982, Ser. No. 360,802

Int. Cl.³ F23C 7/00

U.S. Cl. 431—187 **17 Claims**



1. A soaking pit for steel mills and the like, comprising:

a soaking pit furnace having an enclosed area above the floor of the furance;

a burner in the enclosed area of the furnace, the burner having a generally ring-shaped exterior housing, and a tubular inner ring inside the exterior housing and spaced from the housing for forming a hollow annular chamber between the exterior housing and the inner ring, the housing having an upper exterior wall spaced closely apart from an adjacent upper end of the inner ring, forming a narrow annular burner opening above the chamber;

the burner further including an air supply pipe extending through a hollow interior space inside the inner ring of the burner, the air supply pipe having an upper end spaced below the narrow annular burner opening, the air supply pipe being spaced from the surrounding inner ring of the burner and positioned so that air flowing through the air supply pipe is directed toward and past the burner opening and into the furnace;

gas supply means for supplying gaseous fuel to the chamber of the burner ring for causing the fuel to flow through the narrow burner opening and into the furnace above the upper end of the burner;

means for supplying air, in the substantial absence of fuel, to the air supply pipe at a greater pressure than the pressure of gaseous fuel passing through the burner opening, so that the air flowing through the air supply pipe passes upwardly past the burner opening and into the furnace, the pressure of the air in the air supply pipe creating a low-pressure region in the hollow interior space inside the inner ring of the burner for drawing standing air from the hollow interior space inside the inner ring and standing air surrounding the burner toward the gasseous fuel flowing through the burner opening, so that the air mixes with the fuel flowing through the burner opening to form a combustible fuel/air mixture which, when ignited, produces a blue flame adjacent the upper end of the burner.

4,428,729

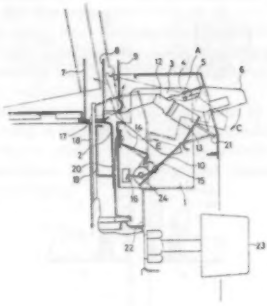
DISCHARGE TYPE IGNITOR FOR OIL STOVE

Kenichi Takino, Yao, and Kenji Murakami, Takaishi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1981, Ser. No. 247,559

Int. Cl.³ F23Q 7/08

U.S. Cl. 431—262 **6 Claims**



1. An ignitor assembly for a liquid fuel stove having a housing including a shell burner in communication with liquid fuel disposed within said housing and a wick operatively positioned to be ignited for igniting the shell burner, said ignitor assembly comprising:

an ignitor plug operatively positioned to be in alignment with an exposed portion of said wick, said ignitor plus being secured to said housing to be fixed in a predetermined position;

voltage source means for supplying power being operatively connected to said ignitor plug for supplying power to create discharge sparks directed towards said wick;

adjustment means for imparting movement to said wick to establish alignment of said wick and said ignitor plug;

actuating means for selectively supplying power to said ignitor plug for igniting said ignitor plug to discharge sparks toward said wick for initially vaporizing liquid fuel and subsequently igniting the wick and the shell burner without imparting movement to said ignitor plug relative to said housing;

said adjustment means including a knob and a shaft rotatably mounted relative to said housing for raising and lowering said wick;

said actuating means being a switch operatively connected to said shaft for selectively being actuated and deactuated as said knob is manually rotated;

a switch housing;

a slide slot being biased to a first position within said switch housing; and

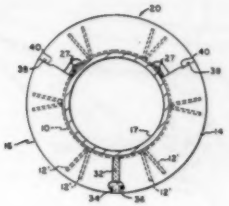
a cam being operatively connected to said slide slot to impart movement to said slide slot to displace said slide slot from said first position to actuate said switch;

said cam and said knob being operatively connected together to rotate in unison, said cam imparting movement to said slide slot to selectively actuate and deactuate said switch.

4,428,730
INSULATION FOR A FURNACE MEMBER

Clyde A. Holmes, Turtle Creek Borough, and Macy W. Vance, Export Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 266,686, May 20, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 401,458
Int. Cl.³ F27D *1/16, 3/02;* D03D *49/26*
U.S. Cl. 432—3 10 Claims



6. A method of making exterior insulation for an internally cooled elongated furnace member, said method comprising:

forming a generally C-shaped metal spring-clip for making intimate contact along substantially all of the inner surface thereof with said member so as to be cooled thereby and remain installed thereon by spring action,

providing a plurality of spaced projections extending outwardly from said spring-clip,

applying an intermediate layer to the outer surface of said spring-clip, said intermediate layer being selected from the group consisting of organic lubricant, inorganic lubricant and refractory fiber material, and then

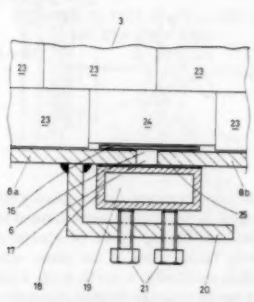
forming circumferentially segmented refractory tiles on said clip covering said projections and curing said refractory,

said intermediate layer serving to reduce friction and prevent cohesion of said tiles to the clip.

4,428,731
SMELTING FURNACE

Robert H. Maes, Hove; André L. Delvaux, Berchem, and Pierre J. Lenoir, Edegem, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Mar. 31, 1982, Ser. No. 363,814
Int. Cl.³ F27D *1/00;* C21B *7/04*
U.S. Cl. 432—247 9 Claims



1. A smelting furnace comprising in combination

(a) a sole made of refractory material,

(b) a metallic casing surrounding said sole, said metallic casing including a plurality of expansion joints,

(c) elastic return means external of said metallic casing, which return means presses inwardly against said metallic casing so that said metallic casing will follow contractions of the sole,

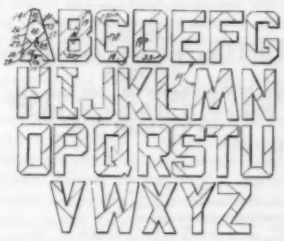
(d) a hollow butt strap abutting the exterior side of each expansion joint, and

(e) means for introducing cooling fluid through each hollow butt strap so as to cool each expansion joint.

4,428,732
EDUCATIONAL AND AMUSEMENT APPARATUS

David A. G. Meyer, 714 E. Washington St., Appleton, Wis. 54911

Filed Dec. 30, 1981, Ser. No. 335,609
Int. Cl.³ G09B *1/40;* A63F *9/10*
U.S. Cl. 434—160 4 Claims

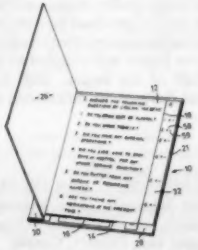


1. An educational and amusement device, comprising a plurality of individual elements each of which defines a character from an alphabet system or a numerical system, each of said elements being divided into a plurality of separate parts defined by a first separating set of a plurality of substantially parallel dividing lines angularly oriented with respect to a centered cartesian coordinate system of said element, a plurality of said elements including a second separating set of lines, said second separating set of lines being angularly oriented lines extending substantially perpendicular to said first plurality of angularly oriented lines, wherein each of said plurality of individual elements includes only said first and second separating sets to define said parts.

4,428,733
INFORMATION GATHERING SYSTEM

Victor Kumar-Misir, 33 Burnview Crescent, Scarborough, Ontario, Canada M1H 1B4

Filed Jul. 13, 1981, Ser. No. 282,701
Int. Cl.³ G09B *1/00*
U.S. Cl. 434—363 28 Claims



1. An information gathering system comprising:

a plurality of question sheets each bearing a different set of questions, said question sheets being superimposed one on top of another and arranged so that one edge of each

underlying question sheet is positioned inwardly a predetermined distance from the corresponding edge of the overlying sheet;

means for holding said question sheets in said superimposed position;

a separate answer sheet on which answers to all the questions on all said question sheets can be indicated at predetermined marked locations, interpretive information regarding each possible answer being provided on the answer sheet adjacent the predetermined location for the answer; and

means for releasably positioning and holding said answer sheet in a correct underlying position relative to said question sheets so that the questions are aligned with the locations on said answer sheet for the answers to said questions.

4,428,734

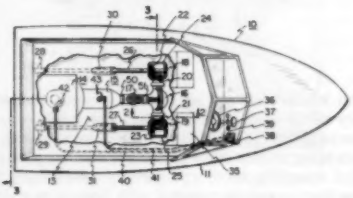
PLANING-HULL TYPE BOATS AND POWER DRIVES THEREIN

Roy S. Ludlow, 1890 Millbrook Rd., Salt Lake City, Utah 84106

Filed Apr. 27, 1978, Ser. No. 900,577

Int. Cl.³ B63H *23/08*

U.S. Cl. 440—75 **3 Claims**



1. A planing-hull type boat including, in combination

a planing-type hull having a transom;

an engine mounted in said hull adjacent to said transom, with a output shaft of said engine extending forwardly of said engine and away from said transom and with the engine being positioned essentially on a longitudinal axis through the said hull;

a propeller drive shaft positioned between the engine and each sidewall of the hull, each said drive shaft extending through a rear portion of the hull and each drive shaft extending in the hull to a location forwardly of the output shaft of said engine;

a propeller on the end of each drive shaft extending through the rear portion of the hull; and

means interconnecting the output shaft and the other ends of each of the propeller drive shafts whereby rotation of the output shaft will cause opposite rotations of the propellers on the ends of the propeller shafts, said means including a differential on the longitudinal axis through the hull and connected through an automative transmission positioned forwardly of the engine and coupled to the engine and to the output shaft of the engine, and right angle drives between output shafts of the differential and the propeller drive shaft.

4,428,735

PROPELLER MOUNT FOR ICEBREAKER

Joe Gruzling; Bengt Johansson; Arno Keinonen; Colin Revill, and Vlodek Laskow, all of Calgary, Canada, assignors to Arctic Pilot Project Inc., Calgary, Canada

Filed Jan. 25, 1982, Ser. No. 342,708

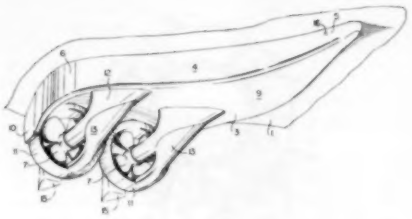
Int. Cl.³ B63H *21/24*

U.S. Cl. 440—76 **2 Claims**

1. A propeller mount for a ship propeller assembly comprising an elongated body for mounting on the hull of a ship proximate the stern thereof, said body when viewed from below being substantially triangular and, when mounted on a hull, a line through a front vertex and the centre of the opposite side of the body being substantially the same vertical plane as the longitudinal axis of the hull, said body includes:

(a) a top surface which conforms to the bottom surface of the hull on which the body is mounted;

(b) a pair of substantially planar sides and an outwardly sloping rear, said sides diverging rearwardly from said



front vertex to a wide rear portion in the area of the propeller assembly and converging toward said rear of the body;

(c) said body being wedge-shaped when viewed from said side;

(d) said wide rear portion being arcuately shaped;

whereby in use the body deflects ice rearwardly and outwardly away from the propeller assembly.

4,428,736

METHODS OF MANUFACTURING A COLOR DISPLAY TUBE HAVING A MAGNETIC GUADRUPOLE POST-FOCUSING MASK

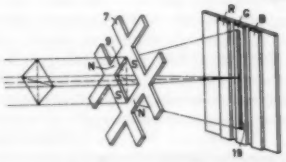
Jan Verweel, and Hinne Zijlstra, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,496

Claims priority, application Netherlands, Apr. 21, 1980, 8002303

Int. Cl.³ H01J *29/07, 9/00*

U.S. Cl. 445—47 **8 Claims**



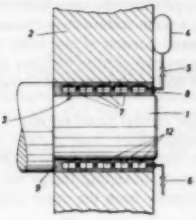
1. A method of manufacturing a color display tube having a magnetic quadrupole post-focusing mask formed by a plate of magnetizable material having rows of apertures provided through oppositely facing sides of the plate, which plate is magnetized so that, cyclically, a north pole, a south pole, a north pole and a south pole are formed along the circumference of each aperture, characterized in that the magnetizing step includes providing two mutually substantially perpendicularly oriented sets of parallel conductors, one set on each side of the plate, each set being provided such that two conductors extend along the material between two rows of apertures, and the magnetizing step also includes causing a current in each set to flow in mutually opposite directions through the two conductors.

4,428,737

FRICTION COUPLING AND COUPLING SLEEVE

Werner Schwenzfeier, and Franz Kawa, both of Leoben, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 20, 1981, Ser. No. 294,705
Claims priority, application Austria, Sep. 10, 1980, 4540/80
Int. Cl.³ F16D *7/02, 25/04*
U.S. Cl. 464—28 3 Claims



1. In a friction coupling comprising a shaft, a hub surrounding the shaft, a coupling sleeve disposed between the shaft and the hub, the coupling sleeve having an elastic hollow wall defining an internal cavity and comprising radially inner and outer peripheral wall portions respectively facing the shaft and the hub, and means for supplying fluid under pressure into the cavity to force the peripheral wall portions against the shaft and the hub under a pressure sufficient for transmitting a torque between the shaft and the hub by the coupling sleeve:

the coupling sleeve consisting of a flexible tube composed of an assembly of a plurality of joined I-section strips, each strip having two transverse web portions and an interconnecting vertical web portion, the transverse web portions of adjacent strips being joined to form the peripheral wall portions of the coupling sleeve and the vertical wall portions constituting load-carrying partitions in the internal cavity for transmitting peripheral forces between the shaft and the hub, the partitions separating the internal cavity into separate annular chamber and defining passages therein to connect the annular chambers, and two profiled end sections joined to the assembly at respective ends thereof.

4,428,738

RESILIENTLY COMPLIANT ROTARY COUPLING

Robert J. Loubier, Fort Wayne, Ind., assignor to Xolox Corporation, Fort Wayne, Ind.

Filed Oct. 2, 1981, Ser. No. 307,784
Int. Cl.³ F16D *3/78*
U.S. Cl. 464—93 5 Claims

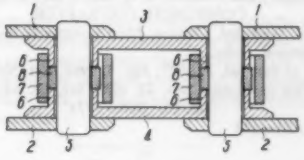
1. A rotary coupling device comprising driving and driven elements rotatable about a given common axis, a coupling member of solid elastomeric material rotatable about said axis and between said elements for imparting rotary motion therebetween, said member having first and second torque connections with said elements, respectively, said coupling member having two different torque characteristics, the first being resilient in a range of torques varying from zero up to a predetermined maximum, and said second being relatively non-yielding for torque values higher than said predetermined maximum, whereby imposition of torques above said predetermined maximum results in substantially direct drive between said elements and those below said value results in a resiliently flexible drive therebetween, said coupling member having diametral slots which intersect intermediate the ends thereof to thereby define an opening about said given axis and being circumferentially distortable, circumferentially adjacent ones of said slots thereby defining regions of solid material therebetween, said first and second torque connections being circumferentially spaced in opposite sides of said diametral slots, respectively, each said torque connection being in the form of a sliding pivotal connection between a region of said member and said elements whereby as said coupling member circumferentially distorts it pivots at each connection in the respective region with respect to an element, each said first torque connection being between said coupling member and one of said elements and each said second torque connection being between said coupling member and the other of said elements, each pivotal connection having a pivot axis which is spaced radially outwardly from, but is parallel to, said given axis, and said slots being of a length which provides at the opposite ends thereof flexible wall sections in said coupling member which permit variation in width of each slot as said coupling member circumferentially distorts, circumferential distortion of said coupling member comprising pivotal movement of said regions and correlative flexing movement of the wall sections said member being distortable when subjected to torque with the walls of said slots being movable toward and away from each other, respectively, the walls of one slot being engageable in response to torque above said predetermined maximum.

4,428,739

ROLLER CHAIN

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 30, 1981, Ser. No. 288,516
Claims priority, application Japan, Aug. 8, 1980, 55-112887[U]
Int. Cl.³ F16H *13/02;* B60S *1/62*
U.S. Cl. 474—231 7 Claims

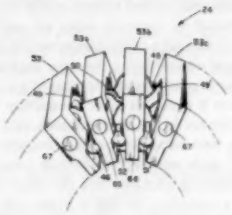


1. A roller chain comprising: a number of pairs of outer link plates, a number of pairs of inner link plates, pins connecting said outer and inner link plates, bushes fitted onto said pins, and rollers supported rotatably on said bushes, respectively, each of said bushes including an elastic member extending lengthwise thereof so that a total axial length of each of said bushes including that of said elastic member controls the spacing between pairs of said inner link plates opposite to each other, said elastic member being elastically deformable to change said spacing, said inner link plates at the outer surfaces thereof being opposed to and in close proximity to the inner surfaces of said outer link plates respectively.

4,428,740
INFINITELY VARIABLE RATIO TRANSMISSION APPARATUS

George E. Moore, 7440 N. Park Dr., Indianapolis, Ind. 46240

Continuation-in-part of Ser. No. 69,787, Aug. 27, 1979, Pat. No. 4,303,404. This application Nov. 30, 1981, Ser. No. 326,045
Int. Cl.³ F16G 5/16
U.S. Cl. 474—242 9 Claims

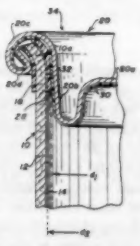


1. A variable ratio transmission apparatus for converting an input torque at a first RPM to an output torque at a second RPM, said variable ratio transmission apparatus comprising:
a frame housing including an input shaft and an output shaft;
a pair of driving discs disposed on said input shaft;
a pair of driven discs disposed on said output shaft; and
a continuous length of chain extending around and between each pair of discs, said length of chain comprising:
(a) a plurality of pins arranged in a row and having a uniform pin center-to-pin center spacing between adjacent pins;
(b) a plurality of link plates pinned together by said plurality of pins, the ends of said pins extending beyond the sides of said link plates; and
(c) a plurality of U-shaped drive members, each having a center opening extending from a front edge to a rear edge of the corresponding drive member and a pin groove extending from said front edge to said rear edge of the corresponding drive member, said link plates being disposed within said center openings and said grooves receiving the ends of said pins said plurality of U-shaped drive members each having a front edge to rear edge width dimension along a line coincident with the transverse centerline of its corresponding pin that is substantially equal to said pin center-to-pin center spacing.

4,428,741
METHOD FOR FORMING A SEAM RELEASE STRIP COMPOSITE CONTAINER

Teddy M. Westphal, Glencoe, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Division of Ser. No. 271,027, Jun. 4, 1981, Pat. No. 4,376,506. This application Nov. 22, 1982, Ser. No. 443,700
Int. Cl.³ B65D 3/14
U.S. Cl. 493—103 3 Claims

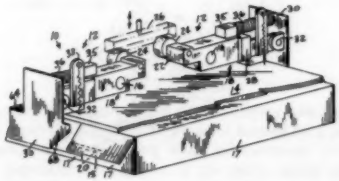


1. A method for forming a composite container for fluent material in the liquid or semi-frozen state comprising the steps of:
(a) providing a spirally wound, vertically arranged cylindrical body member including concentrically arranged fibrous body wall and fluid impervious inner liner layers;
(b) flaring the upper end portion of said body member radially outwardly approximately 15 to 30 degrees relative to the vertical to form a terminating flared portion having a length of approximately one-sixteenth of an inch;
(c) arranging a seam release strip circumferentially about at least the flared portion of said body member;
(d) providing an end closure member for closing the upper end of said body member, said closure member comprising:
(1) a circular central panel portion;
(2) an annular chuck wall portion extending upwardly from said central panel portion; and
(3) an annular connecting flange portion extending radially outwardly from the upper end of said chuck wall portion;
(e) applying an annular bead of sealing material adjacent the junction between said flange and chuck wall portions of said end closure member;
(f) positioning said end closure member relative to the upper end of said body member to place said central panel portion within and extending transversely across the upper end of said body member and to place said chuck wall portion adjacent the outwardly flared portion of said body member, said connecting flange and chuck wall portions cooperating with the inner surfaces of said body member flared portion and the adjacent portion of said body member, respectively, to define an annular space, whereby said annular bead of sealing material is contained in at least the upper portion of said annular space; and
(g) crimping said connecting flange portion inwardly into connecting engagement with said body member and said seam release strip without causing substantial deformation of said body member, thereby causing said mass of sealing material to seal the annular space between the end closure member and the body member, whereby upon pulling of the seam release strip, the end closure member is released for removal from said body member.

4,428,742
FOLDING MECHANISM FOR USE ON A CARTONING MACHINE

Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 3, 1979, Ser. No. 63,620
Int. Cl.³ B31B 1/52, 1/64
U.S. Cl. 493—142 5 Claims



1. An apparatus for use in a cartoning machine for folding and securing the end flaps of a blank to form a carton comprising:
(a) pivoting rocker arm positioned adjacent to the path of said carton movement;
(b) a fold blade pivotedly attached to one end of said rocker arm, said fold blade engaging and disengaging the carton flap and moving said flap against the side of the carton,

said fold blade continuously describing an acute angle with the plane of said flap;

(c) means for manipulating said rocker arm so that said fold blade engages and disengages said flap during a folding cycle;

(d) yieldable means associated with said fold blade to apply a selected pressure to said flap; and

(e) means for varying the pressure exerted by said fold blade against the carton flap.

4,428,743

FLOW-THROUGH CHAMBER

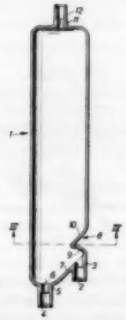
Wolfgang Heck, Hechingen, Fed. Rep. of Germany, assignor to Gambro Dialysatoren KG, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,897

Claims priority, application Sweden, Feb. 16, 1981, 8101025

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—4 **6 Claims**



1. A flow-through chamber for handling sensitive liquids such as blood, comprising a housing including an inlet, an oulet and flow directing means for directing the flow of said liquid from said inlet to said outlet, said flow directing means comprising an indentation of one-piece construction formed by a portion of the wall of said housing, said flow directing means being formed in a manner so as to be positioned in the flow of said liquid between said inlet and said outlet to deflect the flow of said liquid from said inlet towards said outlet in a gradual manner so as to protect said liquid within said chamber.

4,428,744

METHOD AND SYSTEM FOR EXTERNALLY TREATING THE BLOOD

Richard L. Edelson, Roseland, N.J., assignor to Frederic A. Bourke, Jr.; Eleanor F. Bourke; Richard L. Edelson and The Edelson Trust, all of East Norwalk, Conn.

Continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919, which is a continuation-in-part of Ser. No. 272,981, Jun. 12, 1981, Pat. No. 4,398,906. This application Jun. 16, 1981, Ser. No. 274,319

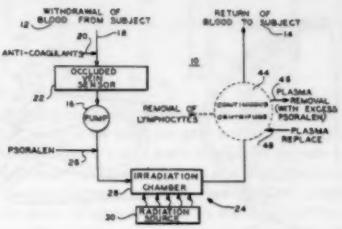
The portion of the term of this patent subsequent to Aug. 30, 1999, has been disclaimed.

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—6 **12 Claims**

1. A method for reducing the functioning population of nucleated cells in the blood supply of a human subject, comprising the steps of:

withdrawing blood from said subject, and irradiating said withdrawn blood with UV radiation in the presence of an effective amount of a dissolved photoactive chemical agent having an affinity for the nucleic acid of the nucleated blood cells and capable when activated by said UV radiation of forming photo-adducts with DNA, to thereby effect chemical bonding between said photoactive chemical agent and the nucleic acid of the nucleated cells, thereby altering the said nucleic acid and inhibiting the



metabolic processes of said nucleated cells; and returning the irradiated blood to said subject.

4,428,745

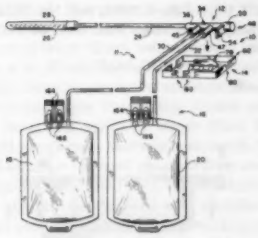
FLOW CONTROL MECHANISM FOR A PLASMAPHERESIS ASSEMBLY OR THE LIKE

Ronald A. Williams, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 21, 1982, Ser. No. 390,464

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—6 **28 Claims**



1. A flow control assembly for flexible fluid conduits comprising

first means including a fluid manifold defining a fluid pathway and including means for attaching two or more flexible fluid conduits to said manifold for establishing flow communications between the attached conduits, and

second means releasably attachable to said fluid manifold and operative, when so attached, for selectively crimping at least one of the conduits attached to said fluid manifold to thereby block said flow communication through said fluid manifold.

4,428,746

GLAUCOMA TREATMENT DEVICE

Antonio Mendez, P.O. Box 925, Calexico, Calif. 92231

Filed Jul. 29, 1981, Ser. No. 288,150

Int. Cl.³ A61M *5/00*

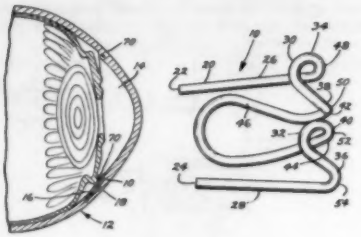
U.S. Cl. 604—8 **14 Claims**

12. Glaucoma treatment device for surgical implant in an eye, said device comprising:

a. at least two small loop means on one plane providing a discharge channel from an anterior chamber of said eye; and,

b. at least one large loop means connecting between said two small loop means and two member means connected to outer ends of said small loop means providing channels for

surfacing within sclera of said eye whereby said discharge channel means and said channel surface member means



provide for discharge of aqueous humor from an anterior chamber of said eye.

4,428,747

TAMPON BLISTER PACK

Axel Friese, Weststrasse 68, D-5600 Wuppertal, Fed. Rep. of Germany, and Stefan Simon, Herzfelderstrasse 9, A-2351 Wiener Neudorf, Austria

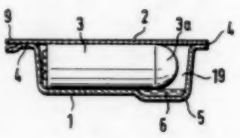
PCT No. PCT/DE81/00027, § 371 Date Sep. 21, 1981, § 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02251, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 4, 1981, Ser. No. 305,636

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004164

Int. Cl.³ A61F *13/20*

U.S. Cl. 604—12 **5 Claims**



1. In combination, a tampon and a tampon blister pack for containing said tampon and a substance to be applied to the tampon prior to use comprising:

a continuous deep drawn film comprising a first chamber containing said tampon and a second chamber for providing a depot for said substance;

said chambers being spaced apart to preclude contact between said tampon and said substance prior to use;

a single cover film overlying said continuous deep drawn film and preventing access to both of said chambers until said cover film is removed.

4,428,748

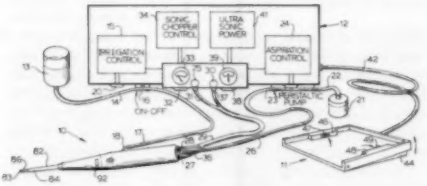
COMBINED ULTRASONIC EMULSIFIER AND MECHANICAL CUTTER FOR SURGERY

Gholam A. Peyman, 1855 W. Taylor, Chicago, Ill. 60612; Notilal Raichand, 2701 W. 35th St., Oak Brook, Ill. 60522, and Edward J. Murray, 9223 W. 119th St., Palos Park, Ill. 60494

Filed Apr. 9, 1980, Ser. No. 138,711

Int. Cl.³ A61B *17/20*

U.S. Cl. 604—22 **15 Claims**



1. An ophthalmic medical cutting instrument comprising a handpiece, an outer tube means, an inner tube means coaxially mounted in said outer tube means, a remote connected ultrasonic generator, an ultrasonic motor connected to said ultrasonic generator means and mounted in said handpiece producing signals in a frequency range above 20,000 cycles per second in and through the handpiece for driving said outer tube means for vibratory fragmentation of eye tissue, a separate drive means connected to said inner tube means and mounted in said handpiece for reciprocably driving said inner tube means for shearing eye tissue, and said outer tube having a side opening so that said inner tube can shear eye tissue and said ultrasonic motor means and said separate drive means can be simultaneously or individually operated.

4,428,749

FABRIC WASHING PROCESS AND DETERGENT COMPOSITION FOR USE THEREIN

Ronald M. Morris, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 12, 1982, Ser. No. 338,945

Claims priority, application United Kingdom, Jan. 14, 1981, 8101120

Int. Cl.³ C11D *3/06, 11/00, 17/06*

U.S. Cl. 8—137 6 Claims

1. A process for washing fabrics comprising the steps of:

(i) contacting the fabrics with a wash liquor containing a synthetic detergent active compound and an alkalimetal or ammonium orthophosphate; and

(ii) subsequently dissolving into the wash liquor an alkalimetal or ammonium pyrophosphate, said wash liquor having a pH between about 8 and about 12 and said wash liquor containing substantially no alkalimetal or ammonium polymerphosphate,

the fabrics being in contact with said wash liquor containing said orthophosphate till at least half the calcium hardness has precipitated as a macroscopic calcium orthophosphate precipitate before contacting the fabrics with pyrophosphate.

4,428,750

PROCESS FOR THE LOCALIZED LIGHTENING, WHITE DISCHARGING OR COLORED DISCHARGING OF DYEINGS ON TEXTILE SHEET-LIKE STRUCTURES USING DYE DISSOLVING AGENT

Walter Birke; Hans-Ulrich von der Eltz; Franz Schön, all of Frankfurt am Main, and Erich Feess, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 327,584, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 154,526, May 29, 1980, abandoned. This application Feb. 18, 1983, Ser. No. 467,956

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922373; Jul. 14, 1979, 2928601

Int. Cl.³ D06P *5/15*

U.S. Cl. 8—461 10 Claims

1. A process for localized white discharging or colored discharging of dyeing on a textile sheet-like article of fibrous structure, which article has been treated by dyeing it to completion with a non-reactive disperse dyestuff, vat dyestuff, or leuco-ester of a vat dyestuff, or impregnating it therewith and drying it without fixing of the dyestuff, which comprises

applying to the dyestuff-treated textile sheet-like article in a predetermined pattern a printing paste which, in addition to one or more thickeners, other customary assistants and water, contains an assistant selected from the group consisting of oxethylated fatty acids, oxethylated fatty alcohols and oxethylated alkylphenols and which is a solvent for said dyestuff at elevated temperature but does not destroy the dyestuff by reduction and does not attack the fiber of said textile sheet-like article at thermosol conditions, and

subjecting the dyestuff-treated textile sheet-like article, to which the printing paste has been applied, to dry heat at a temperature of from 180° to 220° C.

4,428,751

WET PROCESSING OF TEXTILE MATERIALS AND FOAM CONTROL COMPOSITION

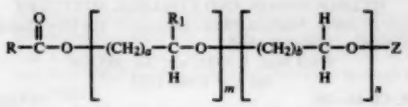
Ralph H. Via, Taylors, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 29, 1982, Ser. No. 362,700

Int. Cl.³ C09B *67/00*

U.S. Cl. 8—477 12 Claims

1. A process for the wet processing of textile materials, which comprises applying to the textile material an aqueous, textile-treating liquor containing a textile-treating component in an amount sufficient to provide a desired effect on the textile material, and further containing in an amount sufficient to provide foam control properties a foam control agent of the formula:



where m and n are both independently selected from integers of from 0 to about 30 with the proviso that the sum of m+n must equal at least 1; a and b are independently selected from integers of from 1 to about 7; R is an aliphatic group containing from 1 to about 40 carbon atoms; R_1 is an alkyl group having from 1 to about 16 carbon atoms, an alkoxy group having 1 to about 7 carbon atoms or an alkoxyalkyl group having from about 3 to about 8 carbon atoms; and Z is hydrogen, halogen, phosphate, or phosphite.

4,428,752

HIGH BULK OLEFIN BLENDED YARN

Bertrand Goldenstein, 30 Cricket La., Great Neck, N.Y. 11024

Filed Jul. 22, 1982, Ser. No. 400,967

Int. Cl.³ D02G *3/04;* D06P *3/79, 3/85, 3/852*

U.S. Cl. 8—529 12 Claims

1. A blended yarn comprising selected percentages by weight of naturally occuring staple fibers and synthetic staple fibers, both said staple fibers separately having a low bulk, said synthetic staple fibers having a lower specific gravity than said naturally occuring staple fibers, said naturally occuring staple fibers having a high moisture absorption property and said synthetic staple fibers having a low moisture absorption property, said synthetic staple fibers being shrunk and providing bulk to said yarn, said synthetic staple fibers being mainly disposed at said yarn's core, said synthetic staple fibers providing a wicking action to transmit moisture from one side of said yarn to an opposite side of said yarn, said synthetic staple fibers being olefin, whereby said blended yarn includes all the comfort features of cotton enhanced by said wicking action of said olefin and the bulking of said yarn, and a fabric formed from said blended yarn can be ironed in a conventional manner.

4,428,753

CONTINUOUS EXTRACTIVE BLENDING PROCESS

Susan A. Bezman, Point Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 25, 1981, Ser. No. 277,440

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—56 7 Claims

1. A continuous process for blending isopropanol from an aqueous solution into a gasoline blending hydrocarbon stream comprising:

(a) mixing at atmospheric pressure and ambient temperature a first stream consisting essentially of an aqueous isopropanol solution having an isopropanol content of at least about 50% with a second stream consisting essentially of a gasoline blending hydrocarbon stream;

(b) passing the resulting mixture through water coalescer means to rapidly separate the mixture into two phases; and

(c) recovering an organic phase which consists essentially of isopropanol and the gasoline blending hydrocarbon stream.

4,428,754

N, N-BIS (HYDROXYALKYL) ALKYL AMIDES AS PHASE SEPARATION INHIBITORS IN LIQUID HYDROCARBON AND ETHANOL MIXTURES

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,134
Int. Cl.³ C10L 1/22
U.S. Cl. 44—56 15 Claims

1. A method for preventing a mixture of hydrous ethanol and a liquid hydrocarbon fuel from separating into two phases comprising adding to the solution an effective amount of a phase separation inhibitor wherein the inhibitor is a N,N-bis(-hydroxyalkyl)alkyl amide represented by the formula:

$$R-\overset{O}{\overset{\|}{C}}-N(R'OH)_2$$

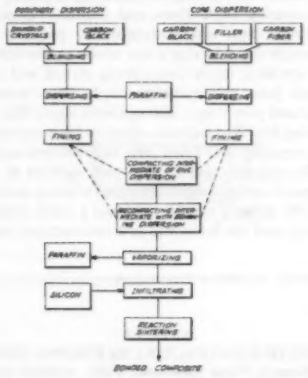
wherein R is a $C_{10\text{-}20}$ alkyl group and R' is a $C_{1\text{-}5}$ akylene group.

4,428,755

PROCESS FOR THE PRODUCTION OF SILICONE CARBIDE COMPOSITE

John M. Ohno, Plymouth, Mich., assignor to General Electric Company

Continuation of Ser. No. 167,019, Jul. 9, 1980, abandoned. This application Oct. 20, 1981, Ser. No. 313,241
Int. Cl.³ C04B 31/16; C09C 1/68
U.S. Cl. 51—307 7 Claims



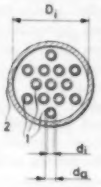
1. A process for preparing a bonded composite comprising:
(a) blending diamond crystals and carbon black to permit an even coating of said diamond crystal surfaces;
(b) forming a first dispersion of said blended diamond crystals and carbon black in paraffin;
(c) forming a second dispersion of carbon fiber, carbon black and filler in paraffin;
(d) compacting one of said dispersions to produce a physically stable intermediate compact;
(e) recompacting said intermediate compact with the remaining dispersion to produce a binary compact;
(f) subjecting said binary compact to a vacuum for a period of time at a temperature sufficient to vaporize essentially all of said paraffin;
(g) infiltrating said binary compact with liquid silicon; and
(h) sintering the binary compact containing infiltrated silicon under conditions sufficient to produce a β-silicon carbide binder uniting said composite.

4,428,756

METHOD AND APPARATUS FOR FILTERING ATOMIC OR MOLECULAR CONTAMINANTS FROM A GAS

Nicolaos Iniotakis, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 857,885, Dec. 6, 1977, abandoned. This application Jul. 11, 1979, Ser. No. 56,784
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655296; Dec. 7, 1976, 2655310
Int. Cl.³ B01D 53/22, 53/02
U.S. Cl. 55—158 12 Claims



5. A filter for cleaning atomic or molecular particles of a contaminating substance out of a flowing gas by adsorption followed by absorption, without constraining the gas to flow through tortuous pores in bodies or layer of filter material, which filter is provided with a gastight casing surrounding a cavity, means for causing the gas to be cleaned to flow therethrough, and a filter material therein having a selective holding-back effect on the particles but not on said gas by mutual interaction, said filter material occupying some but not all of the space in said cavity so that the gas may flow, through passages together having a hydraulic diameter d_{eff} for contact with the filter material over a length l in the flow direction if the gas, in which filter, the improvement is provided consisting in that, in order to obtain a predetermined holding-back capability of the filter and thereby attaining a predetermined value of the filter escape coefficient δ (l,t):
(a) said length l and said hydraulic diameter d_{eff} have values such that the product of the second Stanton number and the quotient obtained by dividing said length by said effective free diameter

$$\left(\frac{l}{d_{eff}} \cdot St\right)$$

is sufficiently large to enable said value of filter escape coefficient to be attained;
(b) the filter material is a material having for the particular gas containing said contaminating substance, for a predetermined rate of flow of said gas and for the predetermined service life t of the filter,
(i) the adsorptive sticking probability α for said particles of said contaminating substance at the surface of said material which is sufficiently large to enable said value of filter escape coefficient to be attained;
(ii) a desorption constant θ sufficiently small to enable said value of filter escape coefficient to be attained;
(iii) a penetration coefficient $(1-\beta)$, and thereby a probability that said particles do not remain on the surface of said material but enter into the interior thereof is sufficiently small to enable said value of filter escape coefficient to be attained;
(iv) a saturation content value $\phi\infty$ and a diffusion constant D of said contaminating substance so great that the value $\phi\infty$ and the product of (i) the quotient obtained by dividing said penetration coefficient $(1-\beta)$ by the square root of said diffusion constant D, (ii) the quotient obtained by dividing the concentration N_G of said particles in said gas,

in cm^3 by said saturation content value (iii) the square root of said service life t and (iv) a value α^*, in cm/sec., equal to $3.63 \cdot 10^3$ times the product of said sticking probability α and the temperature (T) of the surface of the filter material in °K., divided by the mass number (A) of the particles, is less than unity, and

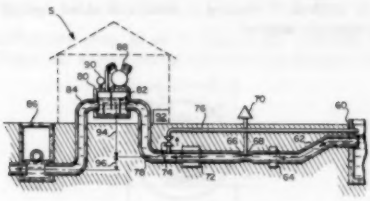
(c) said filter material is provided in said cavity in the form of at least one substantially rigid piece of solid material mounted in said cavity.

4,428,757

SONIC ENERGY FLUID DEGASSING UNIT

Mark N. Hall, P.O. Box 162, College Place, Wash. 99324

Filed Sep. 22, 1981, Ser. No. 304,459
Int. Cl.³ B01D *51/08*
U.S. Cl. 55—277 **18 Claims**



1. A sonic energy fluid degassing unit, comprising

a. a conduit through which fluid containing entrained gases flows;

b. a sonic energy transducer assembly having at least two spaced apart sonic energy generators each having a different frequency, said different frequency decreasing from one said sonic energy generator to the next in the direction of said fluid flow, connected to the conduit for applying sonic vibration to the passing fluid stream in the conduit to induce growth of gas bubbles of entrained gases therein;

c. at least one venturi located in said conduit including means for introducing foreign matter into said entrained gas fluid; and

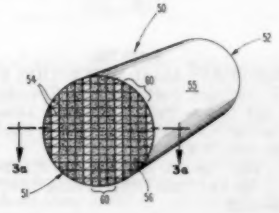
d. gas bubble removal means for removing the gas bubbles from the fluid stream.

4,428,758

SOLID PARTICULATE FILTERS

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,996
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—523 **8 Claims**



1. A honeycomb filter body for removing solid particulates from fluids passed through the body comprising:

a matrix of thin, interconnected walls defining an inlet end face and an outlet end face on opposing outer surfaces of the body and a multiplicity of cells extending through the body between the inlet and outlet end faces in a substantially longitudinal and mutual parallel fashion, the thin walls having interconnected open porosity of a volume and size sufficient to enable the fluid to flow at least across the narrow dimensions of the thin walls and to prevent at least a significant portion of the solid particulates in the fluid from passing either completely across or through the thin walls;

a first set of cells, each being open at one end face and closed at the remaining end face;

a second set of cells, each being open at said remaining end face and closed at said one end face;

each of the first and second sets of cells being further divided into a plurality of subsets of mutually adjoining cells of each respective set of the cells; and

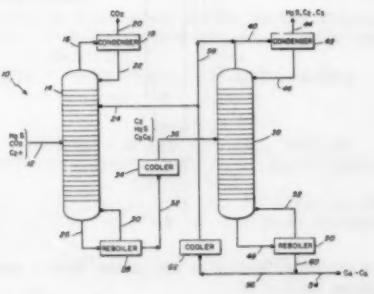
at least one subset of mutually adjoining buffer cells, each buffer cell being closed at the two end faces , the at least one subset of buffer cells being positioned between and adjoining a subset of the first set of cells and a subset of the second set of cells.

4,428,759

DISTILLATIVE SEPARATION EMPLOYING BOTTOM ADDITIVES

James M. Ryan, Weston, and John V. O'Brien, Shrewsbury, both of Mass., assignors to Koch Process Systems, Inc., Westboro, Mass.

Filed Jan. 14, 1983, Ser. No. 458,047
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—17 **30 Claims**



1. In a method for the distillative separation, in a distillative column containing vapor-liquid contact devices, of a hydrocarbon-containing feed stream, which method comprises:

(a) introducing the feed stream into a distillative column operating under defined conditions of pressure, temperatue and feed composition;

(b) withdrawing an overhead product stream enriched in at least one component to be removed from the feed stream;

(c) condensing at least a portion of the overhead product stream in a condenser and recycling a portion of the condensed overhead stream to the top portion of the said distillative column;

(d) recovering a bottom product stream with defined specifications enriched with at least one defined component of the feed stream for which recovery is sought; and

(e) reboiling at least a portion of the withdrawn bottom product stream and recycling a portion of the bottom stream to the bottom portion of the column, the improvement which comprises

introducing from about 1 to 30 mols per 100 mols of feed stream of a recycled liquid bottom product stream comprising C_3–C_6 alkanes into an overhead condenser zone of the distillation column, the liquid bottom product stream introduced into the condenser zone concurrently and

admixed with the overhead product stream in the condenser zone, the overhead product stream not being subject to substantial contamination by the recycled bottom product stream in the condenser zone, and the amount of the recycled bottom product stream sufficient, to provide adjusting of the operating condition of the distillation zone to effect a saving in the distillation column operating energy by:

(a) increasing the temperature of the condenser zone of the distillation column by about 10° F. or more; or

(b) decreasing the temperature of the bottom of the distillation column by about 5° F. or more; or

(c) reducing the distillation column operating pressure by about 20 psi or more.

4,428,760

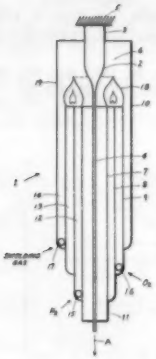
OXYHYDROGEN FLAME TORCH FOR OPTICAL FIBER DRAWING

Shin M. Oh, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,659

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—2 **9 Claims**



7. A method of making an optical fiber from a preform, comprising the steps of

conducting oxygen and hydrogen in separate annular flow paths respectively coaxially surrounding one another and an internal passage along the latter to a heating zone which receives a portion of the preform from which the optical fiber is to be drawn, and

intimately mixing and combusting the oxygen and hydrogen with one another in the heating zone in the form of an annular flame to heat said portion of the preform, and

means for drawing the optical fiber from said portion of the preform substantially centrally of said annular flame and through said internal passage.

4,428,761

LITHOGRAPHIC METHOD OF MAKING OPTICAL FIBERS

Richard E. Howard, Holmdel; William Pleibel, Matawan, and Roger H. Stolen, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1981, Ser. No. 333,433

Int. Cl.³ C03B *37/025, 37/075;* **C03C** *15/00*

U.S. Cl. 65—3.12 **8 Claims**

1. A method of making a birefringent, polarization-preserving optical fiber comprising the steps of:

(a) providing a quartz substrate tube,

(b) depositing at least one glass layer, including a cladding layer, on the interior surface of said tube by a vapor deposition process,

(c) depositing at least one photoresist masking layer on said cladding layer,

(d) patterning said photoresist layer so as to form openings therein which are arranged circumferentially and which expose underlying portions of said cladding layer,

(e) removing said exposed portions of said cladding layer,

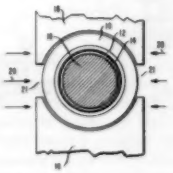
(f) removing said photoresist layer, thereby leaving on said interior surface a circumferentially patterned cladding layer which induces unsymmetric stress and birefringence in said fiber upon subsequent collapse and drawing,

(g) depositing at least one glass core layer on the inside of said tube and over said patterned cladding layer,

(h) radially collapsing said tube by a heating process to form an optical fiber preform, and

(i) drawing an optical fiber from said preform.

5. A method of making a metal-embedded optical fiber comprising the steps of:



(a) providing a quartz substrate tube,

(b) depositing at least one first glass layer, including a cladding layer, on the interior surface of said tube by a vapor deposition process,

(c) depositing at least one metal layer on said first layer,

(d) depositing at least one photoresist masking layer on said metal layer,

(e) patterning said photoresist layer so as to form openings therein which expose underlying portions of said metal layer,

(f) removing said exposed portions of said metal layer,

(g) removing said photoresist layer,

(h) depositing at least one second glass layer, including a core layer, on the inside of said tube and over said metal layer,

(i) radially collapsing said tube by a heating process to form an optical fiber preform, and

(j) drawing an optical fiber from said preform.

4,428,762

VAPOR-PHASE AXIAL DEPOSITION SYSTEM

Matthew J. Andrejco, North Hanover Township, Burlington County, and Eugene Potkay, Hamilton Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,629

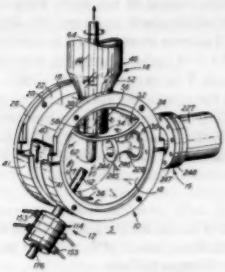
Int. Cl.³ C03B *19/06, 37/025, 37/07*

U.S. Cl. 65—3.12 **11 Claims**

9. A method of fabricating a substantially cylindrical light-guide soot boule in a vapor-phase axial deposition system, comprising:

projecting a stream of soot, formed in a flame, in a first plane, towards a deposition portion of a forming cylindrical soot boule, the axes of the boule and the soot stream being in a first plane; and

confining the first plane between first and second planar surfaces, the distance between said planar surfaces being



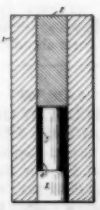
sufficiently close so as to substantially eliminate flame flicker and wander during the formation of the soot boule.

4,428,763

TRANSFER MOLDING METHOD OF PRODUCING FIBER REINFORCED GLASS MATRIX COMPOSITE ARTICLES

George K. Layden, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,801
Int. Cl.[3] C03C *27/00;* B32B *5/02*
U.S. Cl. 65—4.21 2 Claims



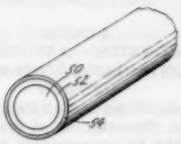
1. A method of making fiber reinforced glass matrix composite articles comprising aligning high temperature stable graphite, silicon carbide, or alumina fibers in a mold cavity circumferentially, axially, or both circumferentially and axially to provide composite strength in the particular direction of alignment, heating a billet of borosilicate, aluminosilicate, lithium aluminosilicate or high silica content glass matrix material to a temperature above about 1,000° C., transferring the glass matrix material into the mold cavity at a pressure of about 10 psi to about 100 psi to surround the bond the fibers with substantially no disturbance of the fiber orientation, cooling the thus impregnated fibers to a temperature below the strain point of the glass, and removing the fiber-matrix composite from the mold thus forming a composite article having composite strength in the particular direction of alignment.

4,428,764

METHOD OF MAKING FUSIBLE SPACER FOR DISPLAY PANEL

Elias Snitzer, West Hartford, and Robert E. Wisnieff, Weston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 105,849, Dec. 20, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 334,492
Int. Cl.[3] C03B *37/025*
U.S. Cl. 65—31 1 Claim



1. A method for forming a fusible spacer used to hold the two sidewalls of a plasma panel, comprising:
forming an elongated core from a glass material having a relatively high softening point;
forming a first cladding from a material which has a softening point in the range of 350° C. to 500° C.;
positioning a second cladding on the first cladding, the second cladding being of the same material as said core;
heating the fusible spacer beyond the softening point of said core material;
drawing the fusible spacer until the diameter of the core is sized to match the desired spacing between the sidewalls of the panel; and
etching the second cladding from the first cladding.

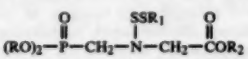
4,428,765

THIOSULFENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE TRIESTERS AS HERBICIDES

James A. Sikorski, Lafayette, Ind., and Tommie G. Curtis, University City, Mo., assignors to Monsanto Company, St. Louis, Mo.

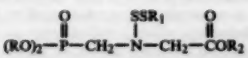
Filed Oct. 5, 1981, Ser. No. 309,322
Int. Cl.[3] A01N *57/30;* C07F *9/40*
U.S. Cl. 71—87 33 Claims

1. A method of controlling undesired plants which comprises applying to said plants or plant growth medium a herbicidally effective amount of a compound of the formula



wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; R_1 is alkyl, cycloalkyl, aralower alkyl or phenyl or naphthyl or phenyl or naphthyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, halogen, and trifluoromethyl and nitro and R_2 is lower alkyl or aralower alkyl.

23. A compound of the formula



wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; R_1 is alkyl, cycloalkyl, aralower alkyl or phenyl or naphthyl or phenyl or naphthyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, halogen, and trifluoromethyl and nitro and R_2 is lower alkyl or aralower alkyl.

4,428,766

2H-1,2,4,6-THIATRIAZINE-1,1-DIOXIDES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Gerhard Hamprecht, Winheim; Adolf Parg, Bad Duerkheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

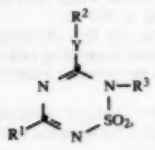
Filed Aug. 24, 1982, Ser. No. 410,875

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134145

Int. Cl.³ A01N *43/72*

U.S. Cl. 71—91 **10 Claims**

1. A 2H-1,2,4,6-thiatriazine-1,1-dioxide of the formula



(I)

where R_1 is hydrogen, a saturated or unsaturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms, a saturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms which is substituted by halogen, alkoxy or alkylmercapto of 1 to 4 carbon atoms, an alkyl or dialkylamino radical where alkyl is of 1 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl which is unsubstituted or substituted by halogen, alkyl or alkoxy of 1 to 4 carbon atoms, or benzyl which is unsubstituted or substituted by halogen, R^2 is a saturated or unsaturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms, a saturated or unsaturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms which is substituted by halogen, alkoxy or alkylmercapto of 1 to 4 carbon atoms or alkanoyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, alkoxycarbonylalkyl or alkylmercaptocarbonylalkyl where each alkyl is of 1 to 4 carbon atoms, phenyl which is unsubstituted or substituted by halogen, an alkyl, haloalkyl, alkoxy, haloalkoxy, alkylmercapto, haloalkylmercapto, alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl or haloalkylsulfonyl radical of 1 to 4 carbon atoms, nitro, cyano, azido, carboxyl, thiocyanato, hydroxyiminomethyl, formyl, an alkoxycarbonyl or alkylmercaptocarbonyl radical of 2 to 5 carbon atoms, an N-alkylcarbamyl, N,N-dialkylcarbamyl, N-alkylcarbamylamino or N,N-dialkylcarbamylamino radical where alkyl is of 1 to 4 carbon atoms, 4-alkyl-1,2,4-oxadiazolidine-3,5-dion-2-yl, an alkanoylamino, alkoxycarbonylamino or alkylmercaptocarbonylamino radical of 2 to 5 carbon atoms, an N-alkylsulfamyl, N,N-dialkylsulfamyl, N-alkylsulfamylamino or N,N-dialkylsulfamylamino radical where alkyl is of 1 to 4 carbon atoms, alkoxysulfonyl of 1 to 4 carbon atoms, alkoxycarbonylaminosulfonyl of 2 to 5 carbon atoms or an alkoxycarbonylalkoxy, alkylmercaptocarbonylalkoxy, alkoxycarbonylalkylmercapto or alkylmercaptocarbonylalkylmercapto radical where each alkyl is of 1 to 4 carbon atoms, or R^2 is benzyl which is unsubstituted or substituted by halogen, nitro or an alkyl, haloalkyl, alkoxy, haloalkoxy or haloalkylmercapto radical of 1 to 4 carbon atoms, or phenoxyalkyl where alkyl is of 2 to 4 carbon atoms, which is unsubstituted or substituted in the phenyl ring by halogen or by alkyl, alkoxy, haloalkyl, haloalkoxy or haloalkylmercapto of 1 to 4 carbon atoms, R^3 is hydrogen, a saturated or unsaturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms, or a saturated straight-chain or branched aliphatic radical of not more than 10 carbon atoms which is substituted by halogen or by alkoxy of 1 to 4 carbon atoms, or is cycloalkyl of 3 to 7 carbon atoms, and Y is oxygen, sulfur, —SO— or —SO_2—,

10. A process for combating the growth of unwanted plants, wherein the plants and/or their location are treated with a herbicidally effective amount of a 2H-1,2,4,6-thiatriazine-1,1-dioxide of the formula I as claimed in claim 1.

4,428,767

SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

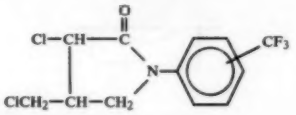
Continuation-in-part of Ser. No. 86,972, Oct. 22, 1979, abandoned. This application Feb. 11, 1980, Ser. No. 120,240

Int. Cl.³ A01N *43/36, 33/02*

U.S. Cl. 11—95 **6 Claims**

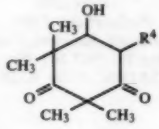
1. A synergistic herbicidal composition consisting essentially of a mixture of

(a) an effective amount of a pyrrolidone of the formula



and

(b) an effective amount of a cyclohexenedione of the formula



in which R^4 is 1'-(2-hydroxyethylimino)ethyl, at a weight ratio of (a) to (b) of from about 0.1:1 to about 5:1.

4,428,768

PROCESS FOR THE RECOVERY OF PLATINUM GROUP METALS FROM REFRACTORY CERAMIC SUBSTRATES

Joseph G. Day, Holmer Green, England, assignor to Johnson Matthey & Co., Limited, London, England

Filed Dec. 8, 1980, Ser. No. 214,267

Claims priority, application United Kingdom, Dec. 31, 1979, 7944656

Int. Cl.³ C22B *11/02*

U.S. Cl. 75—10 R **17 Claims**

1. A process for the recovery of platinum group metals present in a used auto emission control catalyst comprising a refractory ceramic substrate having the platinum group metal deposited on or contained in the refractory ceramic substrate, the said substrate containing an aluminum-silicate and/or alumina, said process comprising preparing, in divided form, a charge containing the refractory ceramic substrate bearing the said metals, one or more fluxes, and a collector material or collector material precursor, for the metal or metals to be recovered, feeding said charge into a high intensity plasma arc furnace and heating the charge to a temperature in the range 1500°–1750° C. by means of the high intensity plasma arc of said furnace to produce a molten metallic phase containing a substantial proportion of the said metal or metals formerly

deposited on or contained in the substrate, and a molten slag phase containing flux, ceramic residues and the remainder of the said metals, separating the two phases, and separating the platinum group metals from the metallic phase, the collector material comprising iron powder or filings, iron sponge or cast iron shavings.

4,428,769

PROCESS FOR INJECTING A REDUCING AGENT INCLUDING ASH-BEARING BITUMINOUS COAL INTO THE HEARTH OF A BLAST FURNACE

Raymond Limpach, Huncherange, Luxembourg, and Dietrich Boecker, Brühl, Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG., Cologne, Fed. Rep. of Germany and Arbed S.A., Luxembourg, Luxembourg

Filed Sep. 3, 1981, Ser. No. 299,005

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3034679

Int. Cl.³ C21B *5/04*

U.S. Cl. 75—30 **10 Claims**

1. A process for injecting a first fine-grain carbon carrier selected from a group consisting essentially of ash-bearing hard and bituminous coal having predominantly acid constituents in said ash, as a reducing agent for iron oxide, into the hearth of a blast furnace, comprising using a mixture of said first fine-grain carbon carrier and at least one other solid fine-grain ash-bearing carbon carrier selected from a group consisting essentially of brown coal, brown coal coke, peat, peat coke, sawdust and mixtures thereof having a basic ash content, wherein the composition of the mixture of said first and other fine-grain carbon carriers is so selected that the degree of basicity of the resulting overall ash of the mixture is substantially the same as the degree of basicity of the blast furnace slag.

4,428,770

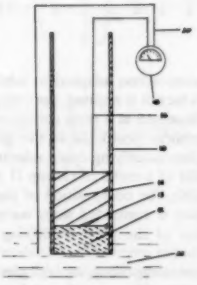
METHODS OF MANUFACTURING METAL FROM A MELT, DETERMINATION OF SULFUR AND CARBON THEREIN, SENSORS THEREFOR AND SOLID ELECTROLYTE COMPOSITIONS FOR SAID SENSORS

Wayne L. Worrell, Narberth, and Qing-Guo Liu, Philadelphia, both of Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed Feb. 23, 1982, Ser. No. 351,473

Int. Cl.³ G01N *27/58*; C04B *35/48, 35/51*

U.S. Cl. 75—45 **66 Claims**



7. A solid solution of:

the oxide of either zirconium, thorium, or hafnium;

the oxide of an element of either of groups IIA or IIIB of the periodic table of the elements; and

either the sulfide or the carbide of said element of either of groups IIA or IIIB.

12. A method of manufacturing melt from a melt comprising contacting said melt with the solid solution of claims **1, 2, 3, 4, 5, 6** or **7**.

13. A process for the detection of sulfur in a fluid comprising:

contacting said fluid with an electrolyte comprising a solid solution of:

from about 75 mole percent to about 98 mole percent of zirconium dioxide;

from about 1 mole percent to about 20 mole percent calcium oxide;

from about 1 mole percent to about 20 mole percent calcium sulfide;

providing a reference electrode in contact with said electrolyte; and

detecting electrical potential between said electrolyte and said electrode.

29. A process for the detection of carbon in a fluid comprising:

contacting said fluid with an electrolyte comprising a solid solution of:

from about 75 mole percent to about 98 mole percent of zirconium dioxide;

from about 1 mole percent to about 20 mole percent calcium oxide;

from about 1 mole percent to about 20 mole percent calcium carbide;

providing a reference electrode in contact with said electrolyte; and

detecting electrical potential between said electrolyte and said electrode.

45. Apparatus for the measurement of sulfur in a fluid comprising:

an electrolyte comprising:

from about 75 to about 98 mole percent of an oxide of a metal selected from the group consisting of zirconium, thorium, and hafnium;

from about 1 to about 20 mole percent of an oxide of an element of either of groups IIA or IIIB of the periodic table of the elements; and

from about 1 to about 20 mole percent of the sulfide of an element of either of groups IIA or IIIB of the periodic table of the elements.

4,428,771

PROCESS FOR THE SEPARATION OF METALS FROM A GASEOUS MIXTURE FORMED DURING REDUCTION

Rudolf Nowak, and Gerhard Holland, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Halomet AG, Basel, Fed. Rep. of Germany

Continuation of Ser. No. 724,516, Sep. 20, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,517

Int. Cl.³ C22B *5/16*

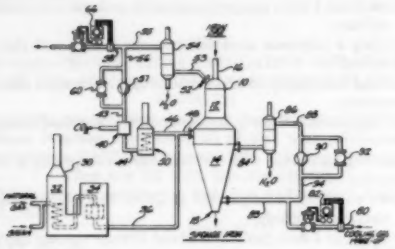
U.S. Cl. 75—89 **18 Claims**

1. A process for separating a metal vapor from a gaseous mixture formed during the reduction of a metal compound comprising the steps of (1) contacting the said gaseous mixture with a solid or liquid absorbent metal or metal salt which is capable of absorbing said metal vapor to be separated but not the accompanying gases, the contacting of said absorbent with said gaseous mixture being accompanied under vigorous turbulence by admixing the absorbent into the reduction reaction mixture in which the gaseous mixture is formed; (2) establishing and maintaining thermodynamic conditions of said absorbent metal or metal salt and said gaseous mixture whereby said metal vapor is absorbed directly by said absorbent metal or metal salt from the gaseous state as a solution of said metal and said absorbent and the non-absorbed gaseous components remain as residual gas, said thermodynamic conditions being selected and maintained so that the metal vapor is not reformed into the original compound; (3) separating the solution consisting of the said metal to be separated off and the absorbent from said remaining residual gas.

4,428,772
METHOD FOR REDUCING METAL ORE

Carlos Dominguez-Ahedo, Garza García; Hector Lopez-Ramos, Monterrey; Alejandro De-Gyves, and Juan A. Villarreal-Trevino, both of San Nicolas de los Garza, all of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Dec. 2, 1981, Ser. No. 326,571
Int. Cl.³ C21B *13/02*
U.S. Cl. 75—91 **12 Claims**



1. A method for reducing particulate metal ore to sponge metal in a vertical shaft, moving bed reactor having a reduction zone in which a hot reducing gas largely composed of carbon monoxide and hydrogen is caused to flow through a portion of said bed to reduce the metal ore thereof to sponge metal, which comprises:

feeding a first steam of reducing gas to the reduction zone of the reactor, said reducing gas having a temperature in the range of 700° to 1000° C. and a maximum combined water and carbon dioxide content of 16% by volume;

removing at least a portion of said first stream from the reactor as a second gas stream;

removing water and carbon dioxide from said second gas stream to form a third gas stream;

feeding said third gas stream to a heater unit;

heating said third gas stream to a temperature in the range of 700° to 1100° C.;

reforming a stream of hydrocarbon-containing gas and water in a reforming unit to form a make-up reducing gas wherein the stream fed to the reforming unit has a water to carbon molar ratio of at least 1.8;

combining said heated third gas stream with the make-up reducing gas at a flow ratio of 1.5:1 to 3.0:1 to form a fourth gas stream; and

recycling said fourth gas stream to the reactor as said first stream.

4,428,773
PROCESS FOR TREATING SPENT FLUIDS TO RECOVER COPPER AND COPPER OXIDE

Kenneth J. Krotz, Dupage, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,803
Int. Cl.³ C01G *3/02*; C22B *15/12*
U.S. Cl. 75—117 **15 Claims**

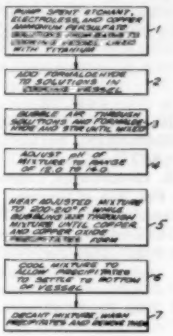
1. A process for recovering copper and copper oxide from a combination of spent ammoniacal etchant, electroless and copper ammonium persulfate bath solutions used in the manufacture of printed wiring boards and for producing an ammonia free decant solution comprising the steps of:

placing the combination and formaldehyde in the ratio of approximately one gallon of formaldehyde per fourteen gallons of the combination in a cooking vessel having its inner surface coated with titanium;

stirring and bubbling air through the contents of the vessel;

adjusting the pH of the mixture to be within the range of 12.0 to 14.0; and

heating the adjusted mixture to a temperature of 200°–210° F. (93.3°–98.9° C.) while bubbling air through the mixture

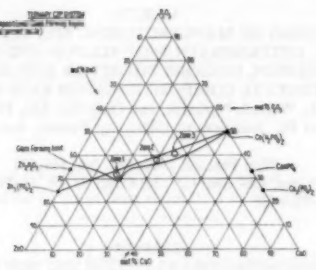

PUMP SPENT ETCHANT, ELECTROLESS, AND COPPER AMMONIUM PERSULFATE SOLUTIONS FROM BATHS TO COOKING VESSEL LINED WITH TITANIUM
ADD FORMALDEHYDE TO SOLUTIONS IN COOKING VESSEL
BUBBLE AIR THROUGH SOLUTIONS AND FORMALDEHYDE AND STIR UNTIL MIXED
ADJUST pH OF MIXTURE TO RANGE OF 12.0 TO 14.0
HEAT ADJUSTED MIXTURE TO 200-210°F WHILE BUBBLING AIR THROUGH MIXTURE UNTIL COPPER AND COPPER OXIDE PRECIPITATES FORM
COOL MIXTURE TO ALLOW PRECIPITATES TO SETTLE TO BOTTOM OF VESSEL
DECANT MIXTURE, WASH PRECIPITATES AND REMOVE THEM

until copper and copper oxide precipitates are formed in the heated mixture such that the mixture is ammonia free.

4,428,774
CORROSION INHIBITING PAINT COMPOSITIONS

Cyril F. Drake, Harlow; Alan Maries, London, and Paul F. Bateson, Duxford, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 2, 1982, Ser. No. 384,299
Claims priority, application United Kingdom, Jun. 2, 1981, 8116816; Jun. 2, 1981, 8116817
Int. Cl.³ C09D *5/08*
U.S. Cl. 106—14.39 **13 Claims**



1. In a paint composition adapted to inhibit corrosion of a metal surface to which it is applied, the composition including a glass material dispersed in a resin carrier, said glass material comprising phosphorus pentoxide as the glass forming oxide and at least one glass modifying oxide selected from the group consisting of oxides of a metal of Group II A and Group II B of the periodic table, the composition of the glass being such that when the glass is contacted with water, phosphate ions and the metal ions of the glass modifying oxide leach into solution;

the improvement comprising, as said glass material, a glass having a solution pH greater than 3.2 and selected from at least one of the three groups of glasses having the following molar compositions:

Group I	ZnO 49.8 to 50.4 CaO 18.0 to 18.5 P_2O_5 31.4 to 31.7,
Group II	ZnO 31.8 to 32.3 CaO 29.0 to 29.8

-continued

	P_2O_5 38.2 to 38.7
and Group III	ZnO 23.9 to 26.3
	CaO 33.6 to 35.0
	P_2O_5 40.0 to 41.3.

4,428,775

REINFORCED CEMENT SHEET PRODUCT CONTAINING NO ASBESTOS FOR FABRICATING ON HATSCHEK MACHINE

Robert M. Johnson, and Elmer M. Melling, both of Kenmore, N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Feb. 11, 1981, Ser. No. 233,663

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.³ C04B 7/35

U.S. Cl. 106—90 67 Claims

1. A fiber-cement product comprising Portland cement in an amount of between about 40% and 80% by weight, fibers in an amount of between about 1% and 15% by weight, clay in an amount of between about 2% and 15% by weight, and poly-(ethylene oxide) in a sufficient amount to coact with said clay in an aqueous slurry containing said Portland cement, fibers and clay to retain fines in a mat formed from said slurry.

4,428,776

CELLULOSIC SEMIPERMEABLE MEMBRANES CONTAINING SILICON COMPOUNDS

George S. Li, Macedonia, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 23, 1982, Ser. No. 391,216

Int. Cl.³ C08J 9/24; C08G 77/56; C08L 1/12

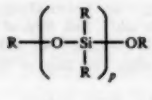
U.S. Cl. 106—122 10 Claims

1. A semipermeable membrane useful for separating a gaseous mixture of carbon dioxide and methane into enriched fractions of each, the membrane prepared from at least one cellulosic polymer and at least one silicon compound of the formulae

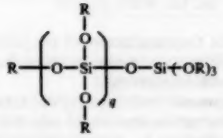
$$R_{4-n}-Si(OR)_n \quad (I)$$

$$R_3-Si-O-Si-R_3 \quad (II)$$

(III)



(IV)



where

each R is independently a hydrogen radical, a halide radical, or an aliphatic, cycloaliphatic or aromatic radical or an inertly-substituted derivative of any one of them, with the provisoes that where R is directly bonded to oxygen, R is not a halide radical and in formula I when n is zero, at least one R is a radical other than hydrogen;

n is an integer of 0–4;

p is an integer of at least 1;

q is an integer of 1–3; and

the silicon compound comprises between about 5 and about 50 weight percent of the membrane, based on the combined weight of the silicon compound and the cellulosic polymer.

4,428,777

PROCESS FOR CLEANING TRANSPORT ROLLS OF FILM DEVELOPING APPARATUS

Mathias Muller, Oberstenfeld, Fed. Rep. of Germany, assignor to Durr-Dental GmbH & Co. KG, Bietigheim, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 357,579

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109935

Int. Cl.³ B08B 8/00

U.S. Cl. 134—6 8 Claims

1. A process of cleaning the film transport rolls of developing apparatus having a transport system comprising a plurality of pairs of rolls for transporting the film from an inlet, through successive aqueous baths and a drying section and out of a discharge, some of said rolls being above and others below the liquid level in said baths, which process comprises passing alone through said transport system of said apparatus a rectangular sheet of fleece material having fibers predominantly oriented parallel to one another and to the longitudinal edges of said sheet, said fibers being substantially free of swelling by action of said baths, and interstices between said fibers absorbing liquid of said baths, said sheet being transported lengthwise by said rolls from said inlet to an out of said discharge, whereby any soluble impurities on said rolls above said liquid level are dissolved and carried away by said material and any insoluble impurities on rolls above or below said liquid level are pressed into said interstices and carried away by said material.

4,428,778

PROCESS FOR PRODUCING METALLIC CHROMIUM PLATES AND SHEETS

Yoshimichi Masuda; Ryuzo Watanabe, both of Sendai; Shinichi Imura, Tokuyama, and Kazutaka Sakiyama, Hofu, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,173

Claims priority, application Japan, Sep. 28, 1981, 56-152116

Int. Cl.³ B22F 3/16

U.S. Cl. 148—11.5 P 4 Claims

1. A process for producing metallic chromium sheets from metallic chromium powders, comprising:

(1) a step of rolling metallic chromium powders;

(2) a step of sintering rolled sheets thus obtained in a temperature range of from 900° to 1400° C.;

(3) a step of re-rolling the sintered sheets with a reduction ranging from 5 to 50%; and

(4) a step of annealing the re-rolled sheets.

4,428,779

HIGH-STRENGTH, HIGH-CONDUCTIVITY COPPER ALLOYS

John T. Plewes, Chatham, and Robert W. Tomb, Ringoes, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 30, 1982, Ser. No. 393,691

Int. Cl.³ C22F 1/08; C22C 9/06

U.S. Cl. 148—12.7 C 7 Claims

1. Metallic body consisting essentially of a copper-nickel-antimony alloy, said alloy comprising nickel in an amount which is here designated as n and which is in the range of from 0.1 to 30 weight percent of said alloy, antimony in an amount which is less than or equal to 1.1 times Ni content, which is greater than or equal to 0.1 weight percent, which is less than or equal to 6 weight percent of said alloy when n is 6 weight percent, which is less than or equal to 4.5 weight percent of said alloy when n is 30 weight percent, and which is less than or equal to an amount which is obtained by linear interpolation

or extrapolation based on 6 weight percent antimony at 6 weight percent nickel and 4.5 weight percent antimony at 30 weight percent nickel, said metallic body having a two-phase or multiphase structure, and said alloy having a tensile strength which is greater than or equal to 80,000 psi.

4,428,780

SOLUTIONS FOR USE IN BONDING PLATES OF STORAGE BATTERIES TO CONNECTING SYSTEMS

Theodore L. Shedroff, Morton Grove, Ill., assignor to Lake Chemical Co., Chicago, Ill.

Filed Feb. 7, 1983, Ser. No. 464,747
Int. Cl.³ B23K *35/34*
U.S. Cl. 148—23 **10 Claims**

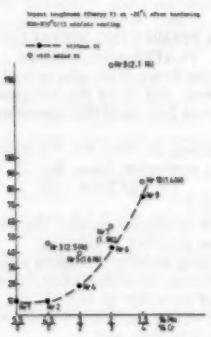
1. A flux having particular application in forming a soldered bond between the lugs of the plates of a lead storage battery and the connecting straps of said plates, said flux consisting essentially of a substantially clear solution in the form of an aqueous solution of a salt formed by a substantially water-insoluble polycarboxylic acid and a water-soluble alkanolamine.

4,428,781

WELDED STEEL CHAIN

Lars A. Norström, Hagfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Sep. 24, 1982, Ser. No. 423,270
Claims priority, application Sweden, Nov. 24, 1981, 8106975
Int. Cl.³ C22C *29/00*
U.S. Cl. 148—36 **17 Claims**



1. Welded chain made from a steel having good weldability and hardenability, a yield point of at least 600 MPa, a rupture limit of at least 900 MPa at room temperature and an impact toughness of at least 40 Joule at −20° C., said steel having the following chemical composition as % by weight:

C: 0.03–0.07
Si: 0.01–1
Mn: max 2.5
Cr: 1.8–3
Ni: 1.5–3
Mo: max 0.5
Nb, V, Ti total 0.0–0.10

wherein the total of Mn+Cr is from about 3 to about 5 remainder essentially only iron and impurities in normal amounts;

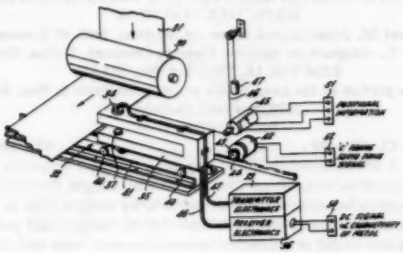
the welded chain having been subjected to heat treatment comprising normalizing at a temperature between 800° and 1000° C., cooling to room temperature, and thereafter duplex annealing at a temperature between about 680° and 790° C.

4,428,782

PRODUCTION OF ALUMINIUM ALLOY STRIP

David J. Walker, South Wirral, and Kenneth Amor, Higher Bebington, both of England, assignors to The Electricity Council, London, Great Britain

Filed Jul. 23, 1982, Ser. No. 401,155
Int. Cl.³ C21D *1/54, 11/00*
U.S. Cl. 148—129 **14 Claims**



1. A method of producing aluminium alloy strip in which hardening of the material is effected by heat treatment to dissolve pre-existing precipitates in the metal matrix so as to give a uniform solid solution followed by quenching in a quenching bath and subsequent ageing, wherein the electrical conductance of the strip after quenching is measured using a conductivity probe scanned across the width of the strip or an array of probes across the width of the strip and wherein the degree of heating across the width of the strip is controlled in accordance with the measured conductance so as to tend to obtain uniform electrical conductance across the width of the strip.

4,428,783

PROCESS FOR THE MANUFACTURE OF VERTICAL P-N JUNCTIONS IN THE PULLING OF SILICON FROM A SILICON MELT

Cord Gessert, Burghausen, Fed. Rep. of Germany, assignor to Heliotronic Forschungs-Und Entwicklungsgesellschaft Für Solarzellen-Grundstoffe mbH, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,331
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049376
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—172 **7 Claims**

1. In a process for the manufacture of p-n junctions in the pulling of silicon ribbons, polygons or tubes from a silicon melt, the improvement comprising:

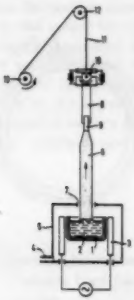
adding to the silicon melt both dopants that act as acceptors and dopants that act as donors, of which the effective distribution coefficients $k_{Aeff}(v_h)$ and $k_{Deff}(v_h)$ at a high crystal growht rate v_h and the effective distribution coefficients $k_{Aeff}(v_n)$ and $k_{Deff}(v_h)$ at a low crystal growth rate v_n satisfy the condition

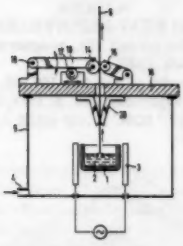
$$\frac{k_{Aeff}(v_n) \cdot k_{Deff}(v_h)}{k_{Aeff}(v_h) \cdot k_{Deff}(v_h)} > 3 \text{ or } < 0.3$$

wherein, generally, v_h is a crystal growth rate higher than the mean pulling speed and v_n is a crystal growth rate lower than the mean pulling speed;

pulling silicon from the melt at a mean pulling speed of from 6 to 120 mm/min.; and

periodically varying the crystal growth rate during the pulling operation between a low rate v_n and a high rate v_h





so that the total length of each p- and n-conductive zone in the crystallized silicon is from 5 to 2000 μm.

4,428,784

BLASTING COMPOSITIONS CONTAINING SODIUM NITRATE

Harvey A. Jessop, Lehi, and Albert G. Funk, Salt Lake City, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

Filed Mar. 7, 1983, Ser. No. 472,721
Int. Cl.³ C06B 45/00
U.S. Cl. 149—2 **8 Claims**

1. A water-in-oil emulsion blasting agent comprising a water immiscible liquid organic fuel as a continuous phase; an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase; particulate inorganic oxidizer salt; an emulsifier; and optionally a density reducing agent; wherein the inorganic oxidizer salt comprises sodium nitrate primarily in particulate form in an amount of from about 40% to about 70% by weight.

4,428,785

BINDER FOR A POLYDIENE COMPOSITE PROPELLANT

Shigeru Suzuki, Sayama; Daizo Fukuma, Sakado, and Kensho Shirota, Sayama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1980, Ser. No. 198,550
Claims priority, application Japan, Oct. 24, 1979, 54-137305
Int. Cl.³ C06B 45/10
U.S. Cl. 149—19.4 **20 Claims**

1. A polydiene composite propellant having a binder obtained by reacting (a) polydiene glycol having a hydroxyl group number of about 1.8–2.1 and a number average molecular weight of about 1,000–5000, wherein said polydiene glycol is obtained by polymerizing butadiene in an organic solvent by using a dilithium compound as a catalyst and treating the resulting polymer with a substance selected from the group consisting of ethylene oxide, propylene oxide, an aldehyde or a ketone to hydroxylate both terminal groups, with (b) a polyol component consisting essentially of a polydiene polyol having a hydroxyl group number from more than about 2.1 to less than about 4.0 and a number average molecular weight of about 1,000–5,000, said polydiene polyol being produced by radical polymerization of a diene compound and (c) a diisocyanate.

4,428,786

PROCESS FOR PREPARING A HIGH POWER EXPLOSIVE, HIGH POWER EXPLOSIVE PRODUCED THEREBY, AND METHOD FOR SHAPING A HIGH POWER EXPLOSIVE

Paul Arni, Hünibach, Switzerland, assignor to Schweizerische Eidgenossenschaft, Vertreten durch die Eidg. Munitionsfabrik Thun der Gruppe für Rüstungsdienste, Thun, Switzerland

Filed May 10, 1982, Ser. No. 376,916
Claims priority, application Switzerland, May 25, 1981, 3403/81; Mar. 9, 1982, 1423/82
Int. Cl.³ C06B 45/02, 21/00
U.S. Cl. 149—21 **55 Claims**

42. Plastic bound high power explosive containing at least 90 percent by weight of a powerful explosive compound selected from the group consisting of cyclotetramethylenetetranitramine and cyclotrimethylenetrinitramine and a maximum of 10 percent by weight of a stabilizing and binding agent substantially comprising in the range of about 20 to about 50 percent by weight of a poly-O-alkyl acrylate having an alkyl group with at least 3 carbon atoms and in the range of about 5 to about 15 percent poly ethylene by weight of said poly-O-alkyl acrylate, the polyethylene having an average particle size in the range of about 0.1 to about 0.3 μm;

comprising further poly tetrafluoroethylene as a lubricant in the range of about 2 to about 7 percent by weight;

comprising in the range of about 20 to about 65 percent by weight of an alkaline earth compound of low water solubility as a filler; and

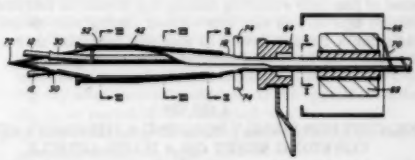
comprising in the range of about 8 to about 20 percent by weight of paraffin.

4,428,787

WRAPPING OF CABLE CORE UNITS

Ali Pan, Storrington, and John R. Ellwood, Napanee, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 19, 1982, Ser. No. 369,341
Int. Cl.³ H01B 13/26
U.S. Cl. 156—54 **15 Claims**



13. A method of wrapping a metal strip material lengthwise along two side-by-side core units of a cable core, the units devoid of jackets and comprising a plurality of pairs of twisted conductors stranded together, in which a central region of the strip material is located between the core units and side portions of the strip material are provided to extend laterally of the central region, one at least partly around each of the core units, said method comprising:

(a) passing the two core units, one down each of two tubes which are relatively disposed with outlet ends closely adjacent and facing in the same direction;

(b) moving the strip material in the same general direction as the core units with said central region located between the tubes and the side portions projecting laterally from between the tubes;

(c) turning the side portions around the tubes, one around each tube, by urging the side portions inwardly towards the tubes while displacing longitudinal edges of the strip material angularly around the tubes;
(d) passing the core units side-by-side downstream from the outlets of the tubes while passing the strip material downstream from around the tube outlets with the central region of the strip material disposed between the core units and the side portions wrapped around but not in intimate contact with the core units; and
(e) suddenly closing the side portions against and into intimate contact with the core units.

4,428,788

FILM-TAPE-CLOSURE DEVICE SLOT CAST INTEGRATED INTERLOCKING STRUCTURE AND EXTRUSION METHOD

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 14, 1982, Ser. No. 378,321
Int. Cl.³ B29D *7/02*; B32B *1/04, 1/10*
U.S. Cl. 156—66 **15 Claims**

1. A method of producing an integrated interlocking closure product comprising extruding a sheet of film onto a rotating casting roll at a rate to provide a high draw-down ratio, extruding a closure tape at a medium draw-down ratio to join said film, extruding a closure device at a small draw-down ratio to join said closure tape, and cooling said film, closure tape, and closure device on said casting roll.

9. Apparatus for producing an integrated film, closure tape, and closure device structure comprising means for extruding a sheet of film onto a rotating casting roll; means for extruding a closure tape to join said film on said casting roll; means for extruding a closure device to join said tape; and means for extracting the integrated structure after cooling.

4,428,789

PROCESS FOR FIRMLY BONDING A THERMOPLASTIC COVERING SHEET ON A HARD ARTICLE

Matsushita Masaaki, and Terado Tetsuo, both of Ichihara, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 22, 1982, Ser. No. 350,611
Claims priority, application Japan, Mar. 5, 1981, 56-30579
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—85 **11 Claims**

1. A process for firmly bonding a thermoplastic covering sheet to a hard article, comprising:
covering a portion of the peripheral surface of a hard article with a heat-shrinkable thermoplastic covering sheet having an adhesive layer; and
heating said covering sheet around said hard article at a high temperature sufficient for causing said covering sheet to shrink, whereby said covering sheet becomes fastened on the peripheral surface portion of said hard article,
which process is characterized in that the covering sheet on said hard article is wrapped with a pressing band comprising a hollow belt which is flexible; and during or after said heating procedure, a fluid within the hollow space in said

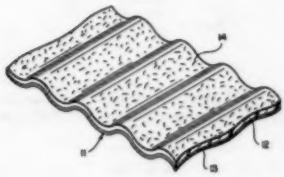
hollow belt is pressurized, whereby said covering sheet is pressed against said hard article.

4,428,790

PLEATED HEAT-RECOVERABLE TAPE

Stephen H. Diaz, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 158,765, Jun. 12, 1980, abandoned. This application Jun. 5, 1981, Ser. No. 272,445
Int. Cl.³ B29C *27/00*; B32B *31/04*
U.S. Cl. 156—86 **17 Claims**



1. A method of covering a a transition in an elongate substrate which does not have an accessible free end, the transition being between a first section of the substrate having a first size and a second section of the substrate having a second size which is substantially larger than the first size, which method comprises:
(a) wrapping around the transition a heat-shrinkable cross-linked polymeric tape which has a plurality of heat-shrinkable generally transverse pleats therein, the tape being wrapped around the transition in a plurality of successive wraps forming a spiral which progresses down the axis of the substrate, with successive wraps being in overlapping relation with each other;
(b) securing the free end of the last of the successive wraps of said tape; and
(c) heating said tape above its shrinkage temperature to cause it to shrink and the pleats to recover and form a continuous covering over the transition.

4,428,791

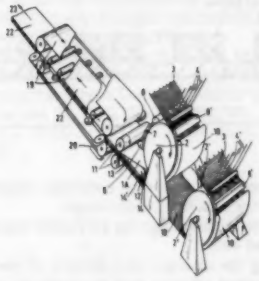
PROCESS AND APPARATUS FOR PRODUCING COMPOSITE BUILDING PANELS, AND PANELS PRODUCED THEREBY

Fritz Reinke, Erbach, Fed. Rep. of Germany, assignor to Fritz Reinke Engineering, Erbach, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,127
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945752
Int. Cl.³ B32B *5/00*
U.S. Cl. 156—161 **45 Claims**

1. A process for the production of composite panels wherein a plurality of bar members are disposed on the periphery of a

rotatable drum, parallel to each other and at small spacings from each other, rotation of the drum causing a slow advance movement of the bar member assembly, wherein, downstream of the location at which the said bar members are applied to the drum, a plurality of thread means which are disposed parallel to each other and which are oriented in the peripheral direction of the drum are wound around the outside of the bar members on the drum, the thread means being wound in a stressed condition whereby the bar members on the drum are pressed against the peripheral surface thereof by a prestressing force, wherein the bar members are joined by means of a



hardenable plastic bonding agent which is applied in fluid form to fibres and a thin layer of suitable material which are disposed around the drum, wherein said bonding agent on the drum is caused to harden, thereby to form a first strip structure, wherein said first strip structure is disposed in a parallel condition with respect to a second strip structure produced in substantially a similar manner, with an adhesive joining agent between the two strip structures, and wherein the two strip structures with said joining agent are passed between pressing means for pressing the two strip structures together and against the joining agent thereby to form an elongate panel structure.

4,428,792

METHOD OF FORMING A STRUCTURAL COLUMN

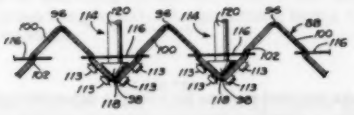
Yukio Kurita, Neyagawashi, and Satoshi Nakagawa, Hirakatashi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Division of Ser. No. 164,324, Jun. 30, 1980, Pat. No. 4,387,546. This application Apr. 26, 1982, Ser. No. 371,726

Claims priority, application Japan, Jan. 29, 1980, 55-009146

Int. Cl.³ B32B *31/18, 31/20*

U.S. Cl. 156—196 **11 Claims**



1. A method of forming a structural column comprising the steps of:

coating very thin layers of wood veneers with an adhesive;

placing a plurality of veneer layers on top of each other to form a stack of veneer layers;

forming the stack of veneer layers into a triangularly shaped wave pattern laminate having alternating crest and valley portions interconnected by diagonal legs, each leg having an offset bend located at an elevation below the longitudinal mid point of the leg,

cutting the formed veneer along a horizontal line extending through the offset bend portion of each diagonal leg to form outer angle-shaped components having formed marginal shoulders, and inner angle-shaped components having formed marginal shoulders;

bonding a pair of inner angle-shaped components together along their formed marginal shoulders to form a hollow inner member having a closed cross section and no exposed edges;

placing a pair of outer angle shaped components over the assembled inner member; and

bonding the outer angle shaped components together and to the outer surface of the inner member to form a unitary, hollow structural column.

4,428,793

PREPARATION METHOD FOR A MICROSCOPIC SPECIMEN AND A DEVICE THEREFOR

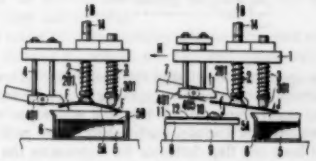
Satoshi Sato, Tokyo; Hiroshi Takahashi, Kodaira, and Tsutomu Nakamura, Tokyo, all of Japan, assignors to Meisei Electric Co., Ltd., Japan

Filed Aug. 18, 1982, Ser. No. 409,129

Claims priority, application Japan, Aug. 25, 1981, 56-125307[U]; Sep. 3, 1981, 56-138849; Mar. 18, 1982, 57-38387[U]

Int. Cl.³ B65C *9/08;* **B65H** *3/46*

U.S. Cl. 156—285 **13 Claims**



1. A method for preparing a microscopic specimen by lifting up coverslips of a sheet shape made of comparatively rigid material from a pile thereof, one by one, comprising:

attractingly holding an uppermost coverslip of the pile on one holding spot on its upper surface and elastically pushing the same on another spot on one end portion of its upper surface spaced apart from the holding spot in a longitudinal direction of the uppermost coverslip;

lifting up the holding spot of the uppermost cover slip and lifting up the pushing spot of the uppermost coverslip with a delay time from said lifting up of said holding spot so as to lift and bend the uppermost cover slip while it is held in an inclined state and within its elastic limit;

pushing an end of the uppermost cover slip at an opposite end thereof to said pushing spot during the lifting of the uppermost coverslip for bending the center portion of the uppermost coverslip within its elastic limit, thereby causing any other coverslip adhering to the uppermost coverslip to be peeled off and dropped; and

gradually eliminating the bending afforded to the uppermost coverslip while it is held.

4. A method for preparing a microscopic specimen according to claim **1**, further comprising:

dropping a liquid mountant on a slide near a test material carried by the slide;

elastically pushing one end in the longitudinal direction, of a coverslip which is comparatively rigid and is in a sheet shape, and attractively holding said coverslip in a slanted position with respect to a plane of the slide

positioning the coverslip and the slide so that they face each other in such a manner that an end part of the coverslip closer to the side thereof corresponds to a spot on the slide at which the mountant has been dropped, and the coverslip plane corresponds to a spot on the slide at which the test material is attached, respectively;

causing the coverslip and the slide to approach each other while maintaining the slanted holding position of the

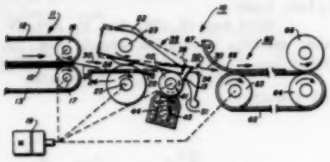
coverslip to have an end part of the coverslip touch the spot on the slide at which the mountant has been dropped;
pressing the end part of the coverslip elastically onto the slide to bend the coverslip within its elastic limit;
gradually eliminating the bend of the coverslip and adhering the coverslip closely to the slide with the mountant placed therebetween; and
releasing the holding of the coverslip.

4,428,794

APPARATUS FOR SEALING ENVELOPES

Robert A. Hayskar, Palatine, and Robert A. Stock, Crystal Lake, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 4, 1982, Ser. No. 405,008
Int. Cl.³ B65B *11/48*
U.S. Cl. 156—442.1 **5 Claims**



5. An apparatus for closing and sealing the adhesive bearing flap portion of envelopes comprising in combination:
(a) an input transport for bringing envelopes to be sealed forward flap first along a predetermined path;
(b) at least one flap deflector for depressing the flap of said envelope out of the path of movement of said envelopes;
(c) at least one flap diverter downstream of said deflector for intercepting said depressed envelope flap and causing said flap to project downwardly;
(d) means to moisten said flap to actuate said adhesive and to assist in closing said flap, said moistening means being disposed adjacent to and upstream of said diverter so that said downwardly projecting flap is proximate to said moistening means and being capable of rotating opposite to the feed direction of said envelope; and
(e) output transport means downstream of said moistening means for receiving said envelopes;
(f) said diverter being disposed below said envelope path so that as said envelope flap is turned downwardly by said diverter the inherent stiffness of said envelope causes said envelope proper to continue to move along said path and past said diverter to said output transport means causing said flap to be tucked under said envelope and drawn into contact with said moistening means whereby said adhesive is activated, said output transport means having sealing means for pinching said envelope and flap together to close said flap and seal said envelope.

4,428,795

PROCESS FOR POLISHING INDIUM PHOSPHIDE SURFACES

Franz Köhl; Anton Schnegg, both of Burghausen, Fed. Rep. of Germany, and Karl Lener, Handenberg, Austria, assignors to Wacker-Chemitronic Gesellschaft fur Electronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,577
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222790
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—636 **5 Claims**

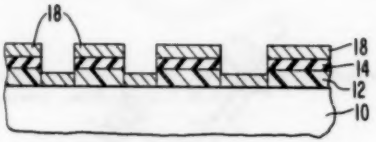
1. A process for polishing indium phosphide surfaces comprising the steps of:
mechanically polishing an indium phosphide surface; and
during the mechanical polishing operation, applying to the surface being polished an oxidizing component that yields free chlorine in an aqueous acidic medium and a component that yields free carbon dioxide.

4,428,796

ADHESION BOND-BREAKING OF LIFT-OFF REGIONS ON SEMICONDUCTOR STRUCTURES

Alvin Milgram, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 2, 1982, Ser. No. 404,108
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—637 **7 Claims**



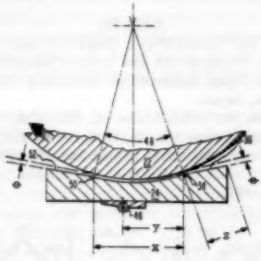
1. A process for removing polyimide regions adhered to semiconductor structures comprising:
heating the structure and the polyimide regions to between 450° and 490° C.;
immersing the structure in a solution of one of methylene chloride and ethylene diamene/hydrazine; and
ultrasonerating the solution and the semiconductor structure.

4,428,797

EXTENDED NIP SHOE FOR A NIP IN A PAPERMAKING MACHINE

Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 26, 1981, Ser. No. 267,397
Int. Cl.³ D21F *3/06, 3/08*
U.S. Cl. 162—358 **22 Claims**



1. An extended nip shoe for a nip in a papermaking machine utilizing a compliant transport system to advance a web of paper and an apparatus for advancing the extended nip shoe to compress the compliant transport system along a portion of a roll, the extended nip shoe comprising:
means for lubricating the compliant transport system entering the nip;
a surface complementary in shape to the roll with which the extended nip shoe forms a nip and against which the extended nip shoe compresses the compliant transport system;
an inrunning nip surface extended approximately 1.5° from a line substantially tangent to a load arc formed by the extended nip shoe against the roll to provide a throat for maintaining a film of lubricant between the compliant transport system and the extended nip shoe during the

application of a compressive force to the compliant transport system;

an outrunning nip surface extended approximately 1.5° from a line substantially tangent to a load arc formed by the extended nip shoe against the roll to controllably distribute the gradual release of the compressive force on the compliant transport system exiting the nip; and

means for controllably distributing the release of the compressive force on side edge portions of the compliant transport system.

4,428,798

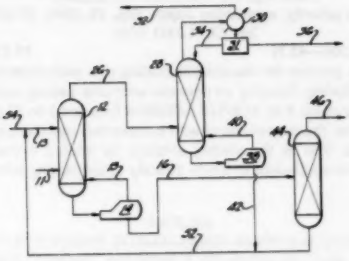
EXTRACTION AND/OR EXTRACTIVE DISTILLATION OF LOW MOLECULAR WEIGHT ALCOHOLS FROM AQUEOUS SOLUTIONS

David Zudkevitch, Denville; Stephen E. Belsky, Morris Plains, and Preston D. Krautheim, Blairstown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 26, 1982, Ser. No. 401,793

Int. Cl.³ B01D *3/40;* **C07C** *29/84, 29/86*

U.S. Cl. 203—18 **16 Claims**



1. A process for the concentration of an alcohol which comprises:

(a) distilling a feed mixture comprising water and an alcohol with at least one extractive solvent comprising a substituted or unsubstituted phenol having at least 6 carbon atoms and a boiling point between about 180° C. and about 350° C. to produce a first overhead vapor stream consisting essentially of water and a first bottoms liquid stream consisting essentially of said alcohol and said extractive solvent; and

(b) distilling said liquid bottoms stream to produce a second overhead vapor stream consisting essentially of said alcohol and a second bottoms liquid stream consisting essentially of said extractive solvent; wherein said alcohol comprises a low molecular weight alcohol having 2 to 4 carbon atoms.

4,428,799

PRODUCTION OF CONCENTRATED ALCOHOL AND DISTILLERY SLOP

Ferris C. Standiford, Greenbank, Wash., assignor to Resources Conservation Co., Seattle, Wash.

Continuation-in-part of Ser. No. 331,205, Dec. 16, 1981, Pat. No. 4,381,220, which is a division of Ser. No. 206,170, Nov. 12, 1980, Pat. No. 4,328,074. This application Nov. 16, 1982, Ser. No. 442,178

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ B01D *1/28, 3/16*

U.S. Cl. 203—19 **22 Claims**

1. A process for producing concentrated alcohol and distillery slop from fermented beer with a reduced amount of energy comprising:

(a) feeding said beer to a beer still;

(b) feeding a portion of a vapor mixture, derived from step (e) hereinbelow, to said still;

(c) withdrawing an alcohol-rich vapor as the overhead from said still;

(d) withdrawing an alcohol-poor distillery slop as the bottom stream from said still;

(e) passing said slop from said still to a multiple effect evaporator to concentrate said slop by evaporating a water and alcohol vapor mixture therefrom;

(f) passing said vapor from said overhead of said still to one of the effects of said evaporator into indirect heat exchange contact with said slop to condense a portion of said vapor and form a condensate;

(g) passing said condensate from said one effect of said evaporator to a condensate stripper and withdrawing an alchol-rich stream as the overhead from said stripper and an alcohol-poor stream as the bottom stream from said stripper;

(h) feeding a portion of said vapor mixture derived from step (e) hereinabove to said stripper;

(i) passing the uncondensed vapor from said one effect of said evaporator to a rectifier to supply substantially all the sensible heat of said vapor to said rectifier and withdrawing concentrated alcohol as the overhead from said rectifier and an alcohol-containing mixture as the bottom stream from said rectifier;

(j) passing said alcohol-containing mixture from said rectifier to said stripper for admixture with said condensate from said one effect of said evaporator; and

(k) withdrawing said concentrated slop from the last effect of said evaporator.

12. A system comprising elements designed, dimensioned

and arranged for producing concentrated alcohol and distillery slop from fermented beer with a reduced amount of energy including:

(a) a beer still;

(b) means for feeding said beer to said still;

(c) means for feeding a portion of a vapor mixture, withdrawn from evaporating means (f) hereinbelow, to said still;

(d) means for withdrawing an alcohol-rich vapor as the overhead from said still;

(e) means for withdrawing an alcohol-poor distillery slop as the bottom stream from said still;

(f) multiple effect evaporator means for concentrating said slop by evaporating a water and alcohol vapor mixture therefrom;

(g) means for passing said slop from said still to said evaporator means;

(h) means for passing said vapor from said overhead of said still to one of the effects of said evaporator means into indirect heat exchange contact with said slop to condense a portion of said vapor and form a condensate;

(i) condensate stripper means for separating said condensate into an alcohol-rich overhead stream and an alcohol-poor bottom stream;

(j) means for passing said condensate from said one effect of said evaporator means to said condensate stripper means;

(k) means for feeding a portion of said vapor mixture withdrawn from said evaporator means to said stripper means;

(l) rectifier means for separating uncondensed vapor from said evaporator means into a concentrated alcohol overhead stream and an alcohol-containing mixture as a bottom stream;

(m) means for passing the uncondensed vapor from said one effect of said evaporator means to said rectifier means;
(n) means for passing said alcohol-containing mixture from said rectifier means to said stripper means for admixture with said condensate from said one effect of said evaporator means; and
(o) means for withdrawing said concentrated slop from the last effect of said evaporator means.

4,428,800

MEASUREMENT OF GASEOUS FLUORIDE CONCENTRATION USING AN INTERNAL REFERENCE SOLUTION

Gary P. Tarcy, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 15, 1982, Ser. No. 418,286
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T **11 Claims**

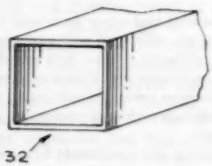
1. In a method for determining fluoride concentration in a fluoride-containing gas, said method including the steps of
(a) mixing a sample of the gas with water in a gas scrubber, thereby dissolving fluoride ion and forming a fluoride-containing solution,
(b) collecting said fluoride-containing solution,
(c) determining the concentration of fluoride ion in said fluoride-containing solution in a potentiometric apparatus by measuring the electric potential developed between a first electrode contacting said fluoride-containing solution and a second electrode contacting said fluoride-containing solution, said first electrode having an element sensitive to the fluoride ion concentration and insensitive to chloride ion concentration, and said second electrode having an element sensitive to the concentration of an ion selected from the group consisting of chloride, bromide and iodide ions,
the improvement wherein, for the purpose of reducing error caused by evaporation of water and without introducing error resulting from loss of mist from the gas scrubber, said method further comprises the steps of
(d) dissolving a known quantity of a water-soluble chloride, bromide or iodide salt in a known volume of water, thereby to form an aqueous internal reference solution,
(e) mixing said sample of the gas with the internal reference solution of step (d) in step (a), and
(f) maintaining the pH of said fluoride-containing solution below 8 during step (c).

4,428,801

METHOD AND DEVICE FOR PROVIDING SHAPED ELECTROFORMED PARTS USING SHRINKABLE TUBE MEMBERS

William P. Dugan, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 30, 1982, Ser. No. 429,648
Int. Cl.³ C25D *1/02, 1/10*
U.S. Cl. 204—9 **16 Claims**



1. The method of electroforming a metal part comprising the steps of:
providing a mandrel of a particular size and shape which will develop a desired size and contour for forming the part when a shrinkable member is shrunk onto the mandrel;
applying heat to said member whereby said member shrinks into a tensioned contour established by the mandrel shape;
depositing a metallic layer on said member to form a part;
removing the mandrel from within the member;
applying heat to said member to develop further shrinkage of the member away from the deposited layer; and
removing the shrunken member from said part.

4,428,802

PALLADIUM-NICKEL ALLOY ELECTROPLATING AND SOLUTIONS THEREFOR

Masao Kanai, Suwa, and Hirotomo Koshiro, Ichihara, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Nisshin Kasei Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 18, 1981, Ser. No. 303,663
Claims priority, application Japan, Sep. 19, 1980, 55-130362
Int. Cl.³ C25D *3/56*
U.S. Cl. 204—43 N **17 Claims**

7. In a process for electrolytic plating of a palladium-nickel alloy including forming an aqueous ammonia plating solution including about 5 to 30 g/l of palladium ions and 5 to 30 g/l of nickel ions, the improvement which comprises replenishing the palladium ions in the plating solution by adding crystalline tetraamminepalladous chloride directly to the plating solution.

4,428,803

BATHS AND PROCESSES FOR ELECTRODEPOSITING ALLOYS OF COLBALT, TIN AND/OR ZINC

Wim M. J. C. Verberne, GT 's-Hertogenbosch, and Adriana G. M. Eggels, Tilburg, both of Netherlands, assignors to OMI International Corporation, Warren, Mich.

Filed Feb. 12, 1982, Ser. No. 348,374
Int. Cl.³ C25D *3/56, 3/60*
U.S. Cl. 204—43 Z **6 Claims**

1. A bath composition for electroplating a bright alloy deposit of cobalt and tin or cobalt and zinc on a substrate, comprising cobalt ions, at least one of tin ions and zinc ions, a hydroxy carboxylic acid complexing agent for the metal ions in the bath selected from gluconate and glucoheptonate, and a brightening amount of a compound having the formula:

wherein:
R^1 represents an alklyl group having 1 to Y carbon atoms or an alklyl group having from 1 to Y carbon atoms at least one of which is substituted by a hydroxyl group; and
R^2 and R^3 or both represent a hydrogen atom or an alkyl group of 1 to Y carbon atoms or an alkyl group of 1 to Y carbon atoms at least one of which is substituted by a hydroxyl group or an amino group and R^2 and R^3 may be the same or different and may be the same as or different to R^1, Y being an integer from 2 to 6, the bath being substantially free of ammonia or ammonium ions.

4,428,804

HIGH SPEED BRIGHT SILVER ELECTROPLATING BATH AND PROCESS

Yvonne Rymwid, Little Falls, and Kenneth Baker, Bridgewater, both of N.J., assignors to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 205,803, Nov. 10, 1980, abandoned. This application Oct. 27, 1982, Ser. No. 437,057
Int. Cl.³ C25D 3/46
U.S. Cl. 204—46 R 15 Claims

1. An aqueous, stable electroplating bath suitable for high speed production of mirror bright silver deposits at high current densities of up to about 5,000 ASF, said aqueous bath being substantially free of free cyanide, organic phosphonate and nitrate ions, and comprising the following components:

a. an alkali metal, ammonium or amine silver cyanide;

b. a component selected from the group consisting of citric acid, boric acid, alkali metal salts of citric or boric acid, ammonium salts of citric or boric acid, and mixtures thereof; and

c. a bath soluble selenium compound in which the selenium has a valence of 4.

4,428,805

ELECTRODES FOR OXYGEN MANUFACTURE

Donald L. Caldwell, and Mark J. Hazelrigg, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Filed Aug. 24, 1981, Ser. No. 295,352
The portion of the term of this patent subsequent to Jan. 8, 2000, has been disclaimed.
Int. Cl.³ C25B 1/02, 11/06
U.S. Cl. 204—129 18 Claims

1. An electrically-conductive composite for use as an anode for oxygen manufacture comprising an electrically-conductive substrate, an interface coating on said substrate, and a polymetal cobalt spinel outer coating,

said interface coating comprising a layer of at least one metal oxide of the group consisting of lead oxide, tin oxide, antimony oxide, aluminum oxide, and indium oxide,

said polymetal cobalt spinel comprising at least one substituted cobalt oxide spinel conforming substantially to the empirical formula

$$M_xZ_yCo_{3-(x+y)}O_4$$

where M is at least one metal of the Groups IB, IIA, and IIB, wherein Z is at least one metal of Group IA,

where x is greater than or equal to zero, but not greater than 1,

where y is greater than or equal to zero, but not greater than 0.5,

where (x+2y) is greater than zero, but not greater than 1, and where the amounts of M, Z, and Co are sufficient to substantially satisfy the valence requirements of oxygen in the spinel structure.

18. A method for oxygen-generation by electrolyzing an oxygen-containing electrolyte in an electrolysis cell containing an ion permeable divider between cathode means and anode means,

characterized as having for the anode means at least one composite of claim 1.

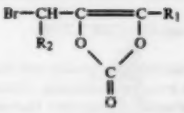
4,428,806

PROCESS FOR PRODUCING BROMINATED 1,3-DIOXOLEN-2-ONES

Fumio Sakamoto, Osaka; Shoji Ikeda, Ibaraki; Goro Tsukamoto, Toyanaka, and Isamu Utsumi, Kyoto, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

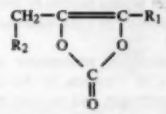
Filed Sep. 28, 1982, Ser. No. 426,158
Claims priority, application Japan, Oct. 30, 1981, 56-172719
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 HA 9 Claims

1. A process for producing a brominated 1,3-dioxolen-2-one of the following general formula (I)



(I)

wherein R_1 represents a hydrogen atom, a methyl group, or an aryl group, and R_2 represents a hydrogen atom, or R_1 and R_2 may be bonded together to form $-(CH_2)_n-$ in which n represents an integer of 3 to 5, which comprises reacting a compound of the following formula (II)



(II)

wherein R_1 and R_2 are as defined, with bromine under radical generating conditions.

4,428,807

COMPOSITION CONTAINING POLYMERIZABLE ENTITIES HAVING OXIRANE GROUPS AND TERMINAL OLEFINIC UNSATURATION IN COMBINATION WITH FREE-RADICAL AND CATIONIC PHOTOPOLYMERIZATIONS MEANS

George A. Lee, Wayland, Mass., and Richard A. Hickner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1978, Ser. No. 921,011
Int. Cl.³ C08F 2/50, 4/32
U.S. Cl. 204—159.14 7 Claims

1. A photocurable resin composition comprising (A) a partially esterified epoxyester of a terminally unsaturated monocarboxylic acid and a polyepoxide, (B) a curing system consisting essentially of (1) a free radical photoinitiator and (2) a radiation sensitive aromatic onium salt of an element of Group Va or VIIa, said onium salt capable of inducing the cure of (A) by releasing a Lewis acid catalyst when exposed to radiant energy.

4,428,808

METHOD FOR OBTAINING ORIENTED GOLD AND PIEZOELECTRIC FILMS

Robert W. Weinert, Monroeville, and Donald H. Watt, Turtle Creek, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1981, Ser. No. 249,805
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 C 38 Claims

1. A method for depositing a layer of gold having a preferred crystalline orientation on the surface of a material which normally produces a layer of gold having no preferred crystalline orientation comprising the steps of:

sputtering a layer of glass over said surface of said material, and

depositing a layer of gold over said layer of glass.

4,428,809

METHOD AND APPARATUS FOR FORMING ELECTRICALLY CONDUCTIVE TRANSPARENT OXIDE

Klaus J. Heimbach, Hattersheim; Wolf-Dieter Münz, Somborn; Rolf Adam, Hanau am Main, and Heinz Wenzl, Abstadt, all of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,432

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112104

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 P 5 Claims

1. A method of producing electrically-conductive, transparent oxide coatings on a water-containing substrate by magnetic-field reinforced cathodic atomization thereonto of a targer hot-pressed from powdered oxide ceramic material selected from the group consisting of indium oxide/tin oxide mixtures, cadmium oxide/tin oxide mixtures and tin oxide, comprising:

(a) atomizing the target with a direct-current voltage of between 150 and 600 volts,

(b) adjusting the power density of the target atomization to from 3 to 15 watt/cm^2 of the target surface,

(c) providing the target with a degree of pressing providing at least 75% of the density of solid material the same as the target powder, and

(d) providing an atomization atmosphere at a pressure of from 1×10^{-3} to 5×10^{-2} mbars, by the controlled introduction of argon, hydrogen and oxygen in a composition which comprises from 2 to 20% of oxygen, 40 to 70% of hydrogen and the rest argon.

4,428,810

METHOD AND APPARATUS FOR DEPOSITING CONDUCTING OXIDE ON A SUBSTRATE

James B. Webb; Digby F. Williams, and Margaret A. Buchanan, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 12, 1982, Ser. No. 377,324

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 P 20 Claims

1. A method for forming on a substrate a conductive oxide film comprising:

(a) feeding into a magnetron sputtering apparatus a gaseous composition containing a reactive gas of hydrogen and an inert gas,

(b) magnetron sputtering a target consisting essentially of high purity oxide in said gaseous composition, and

(c) maintaining said substrate at a temperature whereby the conductivity of the oxide is caused to change to a value greater than 50 $ohm^{-1}cm^{-1}$.

4,428,811

RAPID RATE REACTIVE SPUTTERING OF A GROUP IVB METAL

William D. Sproul, Palatine, and James R. Tomashek, Wood Dale, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 4, 1983, Ser. No. 481,953

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 R 16 Claims

1. A process for the effective, rapid rate reactive deposition of a metallic compound in a chamber, using a metal from group IVb of the periodic table, including the steps of:

evacuating the chamber and then filling the chamber with an inert gas,

providing a target of the metal to be deposited in the chamber,

positioning a substrate to be coated in the chamber below the target,

admitting into the chamber a second gas adapted to react with the metal of the target,

applying electrical power to the target to ionize the inert gas and bombard the target with the gas ions to initiate sputtering,

controlling the level of electrical power supplied to the target to be substantially constant,

sensing the composition of the gases in the chamber and providing a control signal related to the amount of said second gas in the chamber, and

regulating the admission of said second gas to the chamber in accordance with said control signal.

4,428,812

RAPID RATE REACTIVE SPUTTERING OF METALLIC COMPOUNDS

William D. Sproul, Palatine, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 4, 1983, Ser. No. 481,954

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 R 9 Claims

1. A process for the effective, rapid rate reactive deposition of a metallic compound from metals in group IVb of the periodic table in a chamber, including the steps of evacuating the chamber and filling with an inert gas, positioning a substrate to be coated in the chamber below a target of the metal to be deposited, admitting into the chamber a second gas adapted to react with the metal of the target, applying a potential to the target to ionize the inert gas and bombard the target with the gas ions to initiate sputtering, and rapidly pulsing the addition of the reactive gas to the chamber.

4,428,813

CLADDING CATHODES OF ELECTROLYTIC CELL WITH DIAPHRAGM OR MEMBRANE

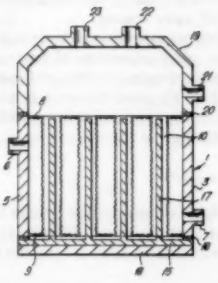
Colin Stanier, Northwich, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 1, 1982, Ser. No. 353,421

Claims priority, application United Kingdom, Mar. 10, 1981, 8107413

Int. Cl.³ C25B 9/00, 13/02; B29H 5/26; B29C 27/04

U.S. Cl. 204—253 12 Claims



1. A method of cladding a separator to a cathode box of the pocket type for use in an electrolytic cell, the cathode box comprising side walls, a top and bottom, and a plurality of pockets substantially parallel to each other and formed by foraminate walls positioned between the top and bottom, in the method a separator in the form of a sleeve is positioned in each pocket of the cathode box with the ends of the sleeves projecting beyond the ends of the pockets, characterised in that those parts of the sleeves projecting beyond the ends of adjacent pockets in a first direction are heat sealed to each other or to additional heat sealable material, those parts of the sleeves

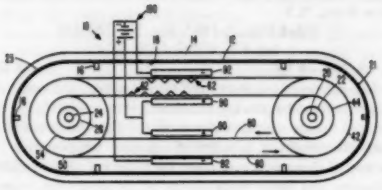
projecting beyond the ends of adjacent pockets in the opposite direction are heat sealed to each other or to additional heat sealable material, and in that the heat sealing is effected by means of radio frequency heating.

12. An electrolytic cell comprising a cathode box having a plurality of pockets therein substantially parallel to each other and formed by foraminate walls, a plurality of anodes substantially parallel to each other and positioned in the pockets of the cathode box, characterised in that the cathode box is clad with a separator by a method as claimed in claim 1.

4,428,814
ELECTROPLATING APPARATUS WITH CONSTANT VELOCITY AGITATION

Tsu-Fang Chen, Dresher, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,400
Int. Cl.³ C25B *15/02*; C25C *7/06*
U.S. Cl. 204—273 **7 Claims**



1. Electroplating apparatus with constant velocity agitation comprising:

a reservoir;

at least one anode in said reservoir;

at least one cathode in said reservoir;

first means for agitating a fluid in said reservoir, said means including an endless first belt having a plurality of paddles on a first surface thereof, said first belt operably connected for movement at a constant velocity in a first direction and having a second surface adjacent said anode;

second means for agitating a fluid in said reservoir, said means including an endless second belt having a plurality of paddles on a first surface thereof opposite said first belt paddles, said second belt operably connected for movement at a constant velocity in a second direction, opposite said first direction, and having a second surface adjacent said cathode; and

said reservoir including a sidewall having a plurality of baffles connected thereto.

4,428,815
VACUUM-TYPE ARTICLE HOLDER AND METHODS OF SUPPORTIVELY RETAINING ARTICLES

Walter W. Powell, Peculiar, and Gary A. Seifert, Lee's Summit, both of Mo., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,448
Int. Cl.³ C25B *9/02*; A45D *42/14*; B60G *11/32*
U.S. Cl. 204—297 W **18 Claims**

1. A vacuum-type holder for at least one article, which comprises:

a housing including walls defining at least one vacuum cavity;

at least one seat formed on an external surface of said housing, said seat being adapted to receive one such article;

at least one opening in said housing communicating between said vacuum cavity and said seat;

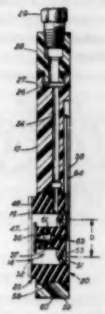
means for coupling the cavity to a vacuum source for generating a vacuum within said cavity; and

means, movably mounted within said cavity, for moving into contact with and for supporting said article through said at least one opening with a supporting force opposite and proportional to a retaining force acting on said article, both the supporting force and the retaining force being substantially proportional to the magnitude of a vacuum within said cavity and acting on said article in response to the vacuum.

2. A vacuum-type holder according to claim 1, wherein said means for moving into contact and for supporting said article comprises:

a resiliently flexible wall enclosing said cavity oppositely across from said at least one opening communicating between said vacuum cavity and said seat; and

at least one contact element mounted to said flexible wall and extending from said flexible wall through said cavity



and toward said at least one opening and said seat, such that in response to placing an article on the seat and generating a vacuum within said cavity, said flexible wall becomes flexed toward said cavity and said seat, and said at least one contact element is urged into contact with an adjacent surface of said article to support such article with a force opposing the urging force acting on the article in response to the vacuum.

7. A vacuum-type holder according to claim 2, wherein at least one contact element is a plurality of contact elements extending toward said seat.

8. A vacuum-type holder according to claim 7, further including means for coupling at least one of said plurality of contact elements to an electrolytic treating circuit.

4,428,816
FOCUSING MAGNETRON SPUTTERING APPARATUS

Walter H. Class, Yonkers; Robert G. Hieronymi, Sloatsburg, both of N.Y., and Steven D. Hurwitt, Park Ridge, N.J., assignors to Materials Research Corporation, Orangeburg, N.Y.

Filed May 25, 1983, Ser. No. 497,798
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **19 Claims**

1. A cathode assembly for use in a magnetron sputtering apparatus, the assembly being adapted to be mounted in an evacuable chamber opposite a substrate plane and including an elongated annular sputtering target which has a sputtering surface composed of a material to be deposited on a substrate disposed at the substrate plane and a contact surface opposite the sputtering surface, a target support, means for clamping the sputtering target with said contact face in thermal and electrical contact with the target support, and a magnet arrangement positioned near the sputtering target for providing a closed-loop tunnel-shaped magnetic field enclosing the sputtering surface of the sputtering target, wherein

the sputtering target comprises first and second elongated side portions and first and second end portions each of said side and end portions having an inner peripheral edge and an outer peripheral edge and said portions being arranged as a rectangular frame, the sputtering surfaces of the side

portions and the end portions being generally flat and respectively inclined toward each other, and the contact surfaces of the side and end portions being approximately flat and parallel to the respective sputtering surfaces of said portions; and

the means for clamping the sputtering target in contact with the target support comprises

means forming an annular pole piece of magnetically permeable metal;

means forming an elongated inner pole piece of magnetically permeable metal,

said elongated inner pole piece having a portion adjacent to each end of the inner pole piece extending in front of the inner edge of the sputtering surface of the adjacent end target portion such that the diagonal air gap distance between each end portion of the inner pole piece and the adjacent corners of the outer pole piece is approximately equal to the transverse air gap distance between the inner pole piece and the outer pole piece intermediate the ends of the inner pole piece.

4,428,817

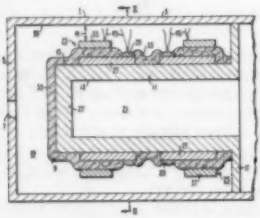
SENSOR CELL STRUCTURE FOR OXYGEN-COMBUSTIBLES GAS MIXTURE SENSOR

Arnold O. Isenberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1982, Ser. No. 407,675

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—412 **6 Claims**



1. A cell structure for an oxygen-combustible gas sensor comprising:

a sensor housing;

a porous mechanical support member of electrically nonconductive material mounted in said housing and dividing said housing into a first zone in communication with a gas to be measured and a second zone in communication with an oxygen containing gas;

an oxygen sensor cell including a first electrode disposed on said porous member; an electrode connection layer in electrical contact with and providing a terminal for said first electrode, said electrode connection layer consisting of an electrically conductive material which does not allow gaseous diffusion therethrough; a thin film layer of solid electrolyte, a portion thereof contacting said electrode connection layer and overlapping said first electrode such that said solid electrolyte in combination with said electrode connection layer seals said first electrode onto said porous member, and a non-catalytic second electrode disposed on said solid electrolyte opposite said first electrode; and

a combustibles sensor cell including a first electrode disposed on said porous member, an electrical connection layer in electrical contact with and providing a terminal for said first electrode, said electrode connection layer consisting of an electrically conductive material which does not allow gaseous diffusion therethrough, a further portion of said thin film of solid electrolyte contacting said combustibles sensor electrode connection layer and overlapping said combustibles sensor first electrode such that said solid electrolyte in combination with said combustibles sensor electrode connection layer seals said combustibles sensor first electrode onto said porous member, and a catalytic second electrode disposed on said solid electrolyte opposite said first electrode; said solid electrolyte and both said electrode connecting layers effectively seal said porous mechanical support member substantially isolating said first zone from said second zone;

whereby both said first electrode of said oxygen sensor cell and said first electrode of said combustibles sensor cell are in communications with the reference gas through said porous support while said non-catalytic second electrode of said oxygen sensor cell and said other catalytic second electrode of said combustibles sensor cell are in communication with the gas to be measured.

4,428,818

LIQUEFACTION OF COAL

Frank J. Derbyshire, State College, Pa., and Darrell D. Whitehurst, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 7, 1982, Ser. No. 447,594

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **5 Claims**

1. In a process for solvent refining of a low rank coal of high oxygen content by mixing a comminuted coal charge with a hydrogen donor recycle solvent derived in the process maintaining the resultant mixture at reaction temperature in the presence of elemental hydrogen for a period of time sufficient to dissolve and react components of the coal, removing normally gaseous and solid materials from the effluent of said reaction, separating a liquid fraction boiling above about 400° F., recycling said liquid fraction to provide said hydrogen donor recycle solvent and recovering a liquid fuel product from the remainder of said effluent, the improvement for providing a hydrogen donor recycle solvent of greater benefit to the process which comprises separately subjecting said low rank coal and a coal of higher rank and lower oxygen content to test dissolution and reaction in admixture with a hydrogen donor solvent under hydrogen pressure at reaction temperature, analyzing the liquid products to determine the weight percent yield of phenols boiling above about 400° F., each of said reactions based on dry weight of the respective coals, calculating a blend ratio of the said coals which will yield less than 15 weight percent of phenols boiling above about 400° F. based on dry coal, adding to said low rank coal an amount of said coal of higher rank corresponding to said calculated blend ratio to provide a blended coal and supplying said blend coal to the process as said comminuted coal charge.

4,428,819

HYDROISOMERIZATION OF CATALYTICALLY DEWAXED LUBRICATING OILS

Paul Shu, Princeton Junction, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,831

Int. Cl.³ C10G *47/00*

U.S. Cl. 208—46 **6 Claims**

1. A process for improving the overnight cloud point of a catalytically dewaxed lubricating oil stock containing petrolatum wax which is relatively insoluble comprising contacting said oil with a catalyst having both an acidic function and a hydrogenation-dehydrogenation function in the presence of hydrogen at hydroisomerization conditions to produce a product containing branched chain isoparaffins which are more soluble at low temperatures, and wherein the conversion of said oil to lower boiling components is less than about 10 weight percent.

4,428,820

COAL LIQUEFACTION PROCESS WITH CONTROLLED RECYCLE OF ETHYL ACETATE-INSOLUBLES

Christopher W. Kuehler, Larkspur, and Samil Beret, Danville, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 14, 1981, Ser. No. 330,521
Int. Cl.³ C10G 1/06
U.S. Cl. 208—10 18 Claims

1. A process for increasing the conversion of coal to ethyl acetate-soluble products in a coal liquefaction process which comprises:

(a) heating a slurry comprising a first solvent and particulate coal in a dissolution zone to produce a first effluent slurry comprising ethyl acetate-soluble component and ethyl acetate-insolubles;

(b) contacting at least a portion of said first effluent slurry with hydrogen in a reaction zone in the presence of an externally-supplied hydrogenation catalyst under hydrogenation conditions to produce a second effluent slurry comprising ethyl acetate-soluble liquid components and ethyl acetate-insolubles which comprise organic components and inorganic components;

(c) contacting at least a portion of said second effluent with a second solvent containing at least 2 weight percent aromatic components to preferentially precipitate inorganic ethyl acetate-insoluble components, and recovering a solids-lean fraction containing ethyl acetate-insolubles enriched in organic components; and

(d) recycling at least a portion of said solids-lean fraction to said dissolution zone.

4,428,821

OIL SHALE EXTRACTION PROCESS

Zeinab H. Baset, Seabrook, Tex., assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Nov. 4, 1982, Ser. No. 438,996
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE 18 Claims

1. In a process for extracting organic material from oil shale solids wherein said oil shale is contacted with a liquid organic solvent, the improvement which comprises treating said oil shale solids at a temperature between about 500° F. and about 800° F. with a basic gas having the formula

$$R_2—\underset{\displaystyle R_3}{\overset{\displaystyle |}{N}}—R_1$$

wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen atoms, and aliphatic radicals having from one to about three carbon atoms prior to or simultaneously with contacting said solids with said solvent, and wherein said oil shale solids are treated with said basic gas at a pressure below the critical pressure of said gas.

4,428,822

FLUID CATALYTIC CRACKING

Henry B. Jones, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,863
Int. Cl.³ C10G 51/00, 11/18; B01J 37/14
U.S. Cl. 208—76 6 Claims

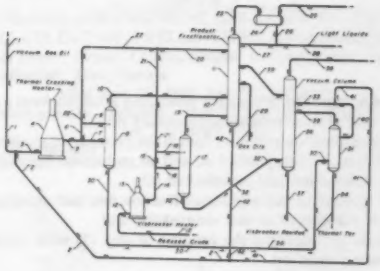
1. In a continuous fluidized catalytic cracking process comprising cracking a naphtha or gas oil feedstock in a riser transport reaction zone and separating hydrocarbon vapor reaction products from coke-contaminated spent catalyst in a reaction-separation zone comprising a fluidized bed of spent catalyst, stripping said spent catalyst in a stripping zone, and regenerating stripped spent catalyst in a regeneration zone wherein coke-contaminated spent catalyst is regenerated at a temperature in the range of from about 1250° F. to about 1500° F. by contact with an oxygen-containing regeneration gas in an amount in excess of the amount theoretically required for complete combustion of coke on said spent catalyst to fully oxidized reaction products effecting substantially complete removal of coke from said catalyst and production of a flue gas comprising nitrogen and carbon dioxide substantially free from carbon monoxide and wherein the coke produced by cracking said feedstock is insufficient for providing heat required to maintain said temperature in said regeneration zone and a high carbon content residual hydrocarbon liquid product from said catalytic cracking process is introduced into said reaction-separation zone into intimate contact with said fluidized bed of coke-contaminated spent catalyst separated from said hydrocarbon vapors effecting cracking of said residual hydrocarbon to hydrocarbon vapors and an additional amount of coke deposit on said spent catalyst, the improvement which comprises supplying a sufficient additional quantity of oxygen-containing regeneration gas to said regeneration zone to consume said additional coke deposit and maintaining an excess of oxygen over that required for complete combustion of said coke including said additional amount of coke on said catalyst and from one to ten mole percent oxygen and from about 0 to about 500 parts per million by volume carbon monoxide in said flue gas, increasing the amounts of said residual hydrocarbon and additional regeneration air when the temperature in said regeneration zone decreases and decreasing the said amounts when the temperature in said regeneration zone increases.

4,428,823

INTEGRATED THERMAL CRACKING AND VISBREAKING PROCESS

Norman F. Hessler, Wheeling; Frank Stolfa, Park Ridge, and William H. Munro, Lincolnshire, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 3, 1983, Ser. No. 455,355
Int. Cl.³ C10G 51/06, 65/18
U.S. Cl. 208—78 6 Claims



1. A petroleum refining process which comprises the steps of:

(a) passing a first feed stream comprising a gas oil and a hereinafter characterized first process stream through a thermal cracking zone, and passing a resultant thermal cracking zone effluent stream into a first separation zone;

(b) passing a second feed stream comprising a reduced crude through a visbreaking heater, and passing a resultant visbreaker heater effluent stream into a second separation zone;

(c) passing a first vapor stream removed from an upper portion of the first separation zone and a second vapor stream removed from an upper portion of the second separation zone into a lower portion of a product fractionation column;

(d) passing a first liquid stream removed from the bottom of the first separation zone into a vacuum flash zone, with a third vapor stream being withdrawn from the top of the vacuum flash zone and being passed into a vacuum fractionation column at an intermediate point;

(e) passing a second liquid stream removed from the bottom of the second separation zone into a lower portion of the vacuum fractionation column;

(f) passing a first portion of a liquid phase lower sidecut stream removed from the vacuum column into the vacuum flash zone and combining a second portion of the lower sidecut stream with at least a portion of the net bottoms stream of the product fractionation column to produce said first process stream;

(g) passing at least a portion of a liquid phase upper sidecut stream removed from the vacuum column into the product fractionation column; and,

(h) recovering a sidecut gas oil product stream and an overhead product stream from the product fractionation zone.

4,428,824

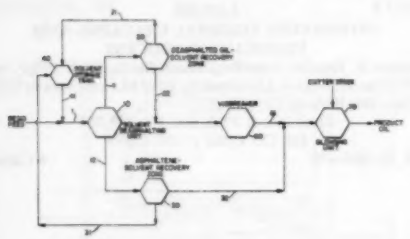
PROCESS FOR VISBREAKING RESID DEASPHALTENES

Byung C. Choi; Benjamin Gross, both of Cherry Hill, and Madhava Malladi, W. Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,778

Int. Cl.³ C10G *55/04*

U.S. Cl. 208—86 **9 Claims**



1. An improved process for producing a fuel oil from a resid feed, said process consisting essentially of:

(1) deasphalting said resid feed in the presence of a solvent to produce a deasphalted oil and an asphaltene fraction;

(2) visbreaking said deasphalted oil;

(3) reblending said asphaltene fraction into said deasphalted oil subsequent to said visbreaking; and

(4) further blending the product of step (3) with viscosity cutter stock oil.

4,428,825

CATALYTIC HYDRODEWAXING PROCESS WITH ADDED AMMONIA IN THE PRODUCTION OF LUBRICATING OILS

John W. Ward, Yorba Linda, and Timothy L. Carlson, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 267,247, May 26, 1981, which is a continuation-in-part of Ser. No. 172,868, Jul. 28, 1980, abandoned. This application Mar. 11, 1982, Ser. No. 357,133

Int. Cl.³ C10G *47/16, 65/12*

U.S. Cl. 208—109 **38 Claims**

1. In the refining of lubricating oils, the improvement comprising catalytically hydrodewaxing a waxy hydrocarbon feedstock in the presence of a catalyst containing a crystalline dewaxing component and in the further presence of ammonia or ammonia precursors added in an amount above that native to the feedstock.

4,428,826

DEWAXING AND UPGRADING OF RAW SHALE OILS

Dennis E. Walsh, Richboro, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,395

Int. Cl.³ C10G *11/05, 47/16*

U.S. Cl. 208—120 **11 Claims**

1. A process for dewaxing a shale oil and converting the shale oil charge fraction to liquid products of lower boiling range which comprises contacting said charge fraction with a crystalline zeolite characterized by a silica/alumina ratio greater than 12, a constraint index between about 1 and about 12 and an acid activity measured by the alpha scale less than 10, said contacting being conducted at about 450° to about 540° C. and a pressure not greater than about 100 psig.

4,428,827

FCC SULFUR OXIDE ACCEPTOR

Simon H. Hobbs, Oak Park; Edward S. Rogers, Glen Ellyn, and George J. Antos, Bartlett, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 24, 1983, Ser. No. 460,433

Int. Cl.³ C10G *25/09*

U.S. Cl. 208—120 **7 Claims**

1. A process for fluidized catalytic cracking of a sulfur containing hydrocarbon feedstock comprising the cycling of fluidized cracking catalyst between a cracking zone, in which said catalyst is contacted at an elevated temperature with said hydrocarbon feedstock and wherein said sulfur containing coke is deposited on said catalyst, and a regeneration zone, in which carbon and sulfur are oxidized and removed from said catalyst to form a flue gas containing sulfur oxides, said catalyst having physically admixed therewith a sulfur acceptor comprising a particulate solid other than said catalyst which contains magnesium, sodium, and aluminum, the precursor of said acceptor comprising a mixture of precipitates comprising compounds of magnesium, and aluminum, which contain compounds of sodium, said precipitates having been simultaneously precipitated at a pH of about 8.0 or above from a common solution comprising magnesium, aluminum and sodium in which said precipitates have highly limited solubility, which acceptor reacts with said sulfur oxides to form spent sulfur containing acceptor, said spent acceptor being freed from said sulfur and renewed by contacting said acceptor with a reducing gas comprising hydrogen or a hydrocarbon gas at reducing conditions, whereby said sulfur becomes dissociated from said acceptor.

4,428,828

UPGRADING HYDROCARBONACEOUS OILS WITH AN AQUEOUS LIQUID

Phillip R. Bose, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 222,231, Jan. 2, 1981, abandoned. This application Nov. 25, 1981, Ser. No. 324,217

Int. Cl.³ C10G *19/02, 21/08*

U.S. Cl. 208—208 R **14 Claims**

1. A process for upgrading a hydrocarbonaceous oil which comprises:

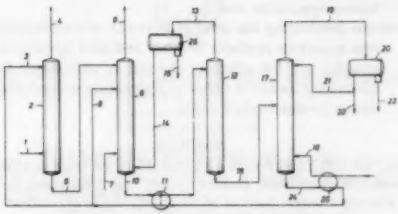
contacting said oil with added free oxygen in an amount not more than about 30 weight percent of said oil, in the presence of an aqueous liquid at a temperature between about 175° C., and 300° C., and at a pressure sufficient to maintain said aqueous liquid at least partially in the liquid phase.

4,428,829

PROCESS FOR SIMULTANEOUS SEPARATION OF AROMATICS FROM HEAVY AND LIGHT HYDROCARBON STREAMS

Walter C. G. Kosters, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 14, 1981, Ser. No. 301,493
Claims priority, application United Kingdom, Oct. 16, 1980, 8033462
Int. Cl.³ C10G 21/02, 21/22
U.S. Cl. 208—314 8 Claims



1. A process for the simultaneous separation of aromatics and non-aromatics from a heavy hydrocarbon stream and a light hydrocarbon stream which comprises:

(a) extracting aromatics in a first extractor from the heavy hydrocarbon stream with the aid of a selective solvent which has a higher boiling point than that of said light hydrocarbon stream,

(b) removing selective solvent from the raffinate obtained from said first extractor, to yield heavy non-aromatics,

(c) extracting aromatics from the light hydrocarbon stream in a second extractor with the aid of the extract phase obtained from the first extractor,

(d) removing selective solvent from the raffinate obtained from said second extractor to yield heavy aromatics and light non-aromatics,

(e) subjecting the extract phase from the second extractor to extractive distillation,

(f) separating the bottom fraction of the extractive distillation by distillation into light aromatics and selective solvent, and

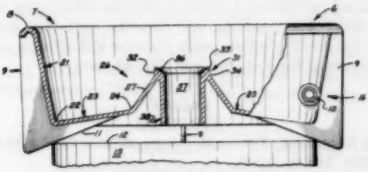
(g) recycling the selective solvent obtained in step (f) at least partially to the first extractor.

4,428,830

PRECIOUS METALS RECOVERY UNIT

Anton Hepfner, 761 Sutter St., Yuba City, Calif. 95991, and Dorothy A. Malicki, Yuba City, Calif., assignors to Anton Hepfner, Yuba City, Calif.

Filed Mar. 24, 1982, Ser. No. 361,227
Int. Cl.³ B03B 5/58
U.S. Cl. 209—211 3 Claims



1. A precious metals recovery unit for processing a mixture of water and pre-screened ore concentrate including gangue and precious metals to remove the tailings and retain the fines and heavier values comprising:

a. a circular bowl including a steep peripheral wall extending downwardly from a rim to a base; and a floor extending from said base inwardly and upwardly at a relatively low gradient to inhibit the inward movement of heavier values collecting at the base of said peripheral wall;

b. a frustum of a vertical hollow cone having a base mounted centrally on said floor, and a wall converging upwardly at a moderately steep angle intermediate the slope of said peripheral wall and the slope of said floor to inhibit the advance of intermediate size particles of precious metal beyond the base of said frustrum;

c. a ring mounted on the upper end of said frustum wall, said ring including a vertical outer perimeter wall terminating at the top in an overflow lip, said vertical perimeter wall allowing gravity to inhibit further upward movement of fines without preventing the tailings from overflowing said lip;

d. a hollow, right circular cylinder mounted on the inner margin of said ring and depending therefrom to define a channel for the discharge of waste material over-flowing said lip of said ring;

e. a nozzle mounted tangentially on and extending through said peripheral wall so as to establish a vortex flow pattern for the water, precious metal particles and tailings within said bowl; and,

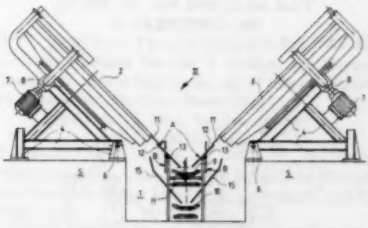
f. a plurality of support legs mounted on said bowl so as to support said bowl on a receptacle.

4,428,831

DISCHARGE ARRANGEMENT FOR REMOVING GREEN PELLETS OUT OF A PELLETIZING ARRANGEMENT

Rainer Dreier, Weyer, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 27, 1981, Ser. No. 325,568
Claims priority, application Austria, Dec. 15, 1980, 6082/80
Int. Cl.³ B07B 1/00
U.S. Cl. 209—253 10 Claims



1. In a discharge arrangement for removing green pellets out of a pelletizing disk or drum, including a discharge chute and a conveying means arranged below said discharge chute, the improvement comprising a green-pellet conveying means, a reconveying means, and a flap arranged between said discharge chute and said green-pellet conveying means, said flap being pivotable between a first position in which said flap elongates said discharge chute toward said green-pellet conveying means and a second position in which said flap is directed transverse to said discharge chute towards said reconveying means to reconvey defective pellets.

4,428,832

SCREENING APPARATUS

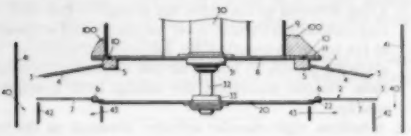
Michael P. Armstrong, Etwall; Rodney W. O'Brian, and Stanley Gilliver, both of Burton-on-Trent, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Nov. 19, 1981, Ser. No. 322,875

Claims priority, application United Kingdom, Dec. 5, 1980, 8039087

Int. Cl.³ B07B *1/08*

U.S. Cl. 209—350 **5 Claims**



1. A sizing screen for particulate material comprising:

a generally circular upper deck having a central plate and a plurality of first radially straight spoke members extending radially outwardly from the periphery of said plate and circumferentially spaced around said periphery, said first spoke members comprising metal rods secured to extend from the periphery of said central plate by means of at least one block of plastics material secured to one side of said plate;

means for delivering material to said upper deck and means for moving said material radially outwardly on said plate toward said spoke members;

a lower deck mounted co-axially below said upper deck and spaced vertically therefrom a distance so that material passing through said upper deck will be separately screened by the lower deck, said lower deck having a central plate and a plurality of second radially straight spoke members spaced circumferentially closer together than said first spoke members and in vertical alignment therewith;

means for rotating both said decks with the lower deck rotating a higher speed than the upper deck;

collection means for collecting treated material discharging over the periphery of the screening decks and material passing through the lower screening deck.

4,428,833

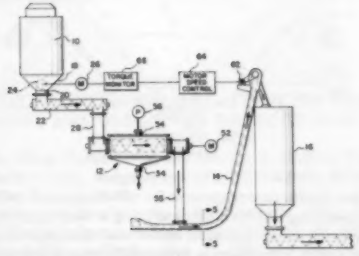
SPENT FLAKE DRAINER-CONVEYOR

William M. Barger, Piqua, Ohio, assignor to The French Oil Mill Machinery Co., Piqua, Ohio

Filed Jul. 6, 1982, Ser. No. 395,752

Int. Cl.³ B01D *23/20*

U.S. Cl. 210—113 **7 Claims**



1. A spent flake drainer-conveyor for transferring spent flakes from a solvent extraction apparatus to a desolventizer-toaster apparatus, comprising:

a closed, vapor-tight housing having an inlet opening defined therein connected to said solvent extraction apparatus for receiving spent flakes therefrom, an outlet opening defined therein connected to said desolventizer-toaster apparatus for introducing spent flakes thereinto, and at least one drainage section formed in said housing;

screen means in said drainage section of said housing past which said flakes move and through which only solvent will pass for separating solvent from said flakes;

means producing a pressure differential across said screen means for assisting in the separation of solvent from said flakes and passage through said screen means;

means for collecting said solvent after it has passed through said screen means;

means for conveying said flakes through said housing from said solvent extraction apparatus to said desolventizer-toaster apparatus; and

means monitoring the level of flakes in said solvent extraction apparatus available to enter said inlet opening of said housing and for adjusting the rate of movement of said conveying means in order to maintain said level of flakes within predetermined limits.

4,428,834

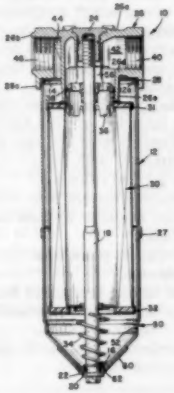
FLUID FILTER WITH INTEGRAL VISCOUS DAMPER

Kendall R. McBroom, Dakota County, and Dhanendra C. Shah, Ramsey County, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 19, 1981, Ser. No. 312,383

Int. Cl.³ B01D *27/10, 35/14*

U.S. Cl. 210—131 **22 Claims**



1. In a fluid filter of the type including a housing, a cover secured to the housing, a filter element guided within the housing for movement between normal and bypass positions, and means for biasing the filter element toward the normal position, the improvement comprising:

step-like restriction means formed in a predetermined location on said housing adjacent the bypass position of said filter element for defining with an end of said filter element and the fluid within the filter a viscous damper to damp oscillation of said filter element between the normal and bypass positions, said step-like restriction being of substantially uniform inside diameter and defining a predetermined annulus with said filter element.

4,428,835

STRAINER

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,396

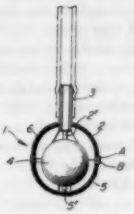
Claims priority, application Japan, Jul. 8, 1981, 56-100657[U]

Int. Cl.³ B01D *35/28*

U.S. Cl. 210—172 **1 Claim**

1. A strainer comprising an outlet tube adapted to be connected to a flexible liquid sucking tube of a liquid sucking device; a perforated spherical shell integral with said outlet

tube and having an internal cavity communicating with said liquid sucking tube; a strainer element attached to said spherical shell; and a ball-like weight disposed and supported by ribs in said cavity of said spherical shell.



4,428,836

HYDRAULIC DISCHARGE SYSTEM

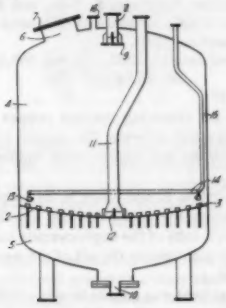
Frank Evans, Sale, England, assignor to British Nuclear Fuels Limited, Warrington, England

Filed Jul. 19, 1982, Ser. No. 399,226

Claims priority, application United Kingdom, Aug. 13, 1981, 8124803

Int. Cl.³ B01D *23/16*

U.S. Cl. 210—189 **4 Claims**



1. An hydraulic system for the discharge of material from a process vessel in which a bed of granular material is supported on the upper surface of a screen within the vessel during normal process operation, comprising first and second fluid flow ducts communicating with the interior of the vessel at opposite sides of the screen for passing liquid through the bed during normal process operation, a granular material discharge conduit extending from an inlet end adjacent and above the upper surface of the screen supporting the bed of material to the exterior of the vessel, with an open gap between the inlet end of the discharge conduit and the upper surface of the screen, and fluid jet means disposed adjacent the screen to selectively direct jets of fluid on to the bed of the material independently of liquid flow though said ducts, whereby in operation, first, a fluid is introduced into the vessel through at least one of the flow ducts independently of the jet means to effect discharge of a major portion of the bed through the discharge conduit and, second, jets of fluid from the jet means effect discharge of the remaining portion of the bed through the discharge conduit.

4,428,837

FLUID TREATMENT DEVICE

Klaus J. Kronenberg, Claremont, Calif., assignor to Trig International, Inc., Cardiff-by-the-Sea, Calif.

Filed Oct. 19, 1981, Ser. No. 312,612

Int. Cl.³ B03C *1/12*

U.S. Cl. 210—222 **6 Claims**

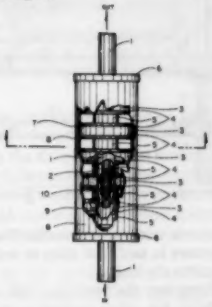
1. A magnetic fluid treatment device to maximize the reduction of mineral deposits within a fluid pipe at a particular fluid velocity, comprising:

a non-magnetic cylindrical fluid conduction tube within which the fluid to be treated flows;

an external inlet and outlet attachment means to support and connect said fluid conduction tube to an external fluid supply source;

an elongated hollow non-magnetic concentrator core tube positioned within said fluid conduction tube and spaced therefrom to form an annular chamber therebetween for axial fluid passage;

a ferrous soft magnetic concentrator core tightly contained within said concentrator core tube and extending throughout its axial length;



a plurality of spaced apart magnetic members of alternating polarity, each consisting of a flat ring magnet positioned between a pair of side magnetic collector disks, whereby magnetic flux lines are communicated axially between the faces of said magnet and said disks and radially between said disks and said concentrator core;

a ferrous soft magnetic concentrator can closely spaced coaxially around said magnetic members whereby magnetic flux lines are communicated axially between the faces of said magnet and said disks and radially between said disks and said concentrator can; and

a plurality of adjustably sized non-magnetic flux separators whereby the spacing between said magnetic members may be tailored to increase treatment efficiency at a specified flow rate.

4,428,838

TUBULAR FILTER STRUCTURE

John L. Creps, Rudolph; Timothy J. Hainen, and Stephen N. McEwen, both of Bowling Green, all of Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Dec. 13, 1982, Ser. No. 449,512

Int. Cl.³ B01D *29/32*

U.S. Cl. 210—323.2 **12 Claims**

1. A filter comprising a container for liquid to be filtered and a frame submersible in said liquid in said container, said frame comprising:

(A) a suction chamber having an apertured wall plate,

(B) a parallel apertured plate, the apertures in said plates being axially aligned,

(C) a removable cover plate adjustably and parallelly attached to said parallel plate,

(D) means to support said parallel plate at a fixed distance parallel to said wall plate, and

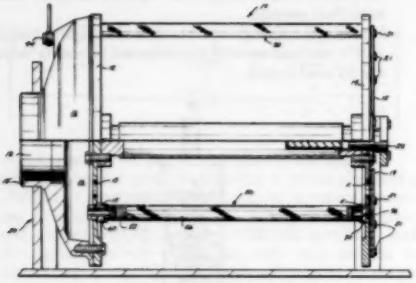
(E) a plurality of filter tubes extending between said aligned apertures in said wall plate and said parallel plate, each said filter tube comprising:

(1) perforated rigid tube having opposite open ends,

(2) bushings insertable in the ends of said tube, each having a rounded outer flange extending over and abutting the ends of said tube,

(3) a tubular fabric sock open at both ends surrounding and longer than said tube so that its ends are tucked around the rounded flanges and into the open ends of said bushings,

(4) a ferrule having a central tubular aperture and a circumferential flange intermediate its ends, one end of said ferrule snugly fitting into the bushing at one end of said tube to hold the tucked-in end of said sock therein, and the other end of said ferrule fitting into an aperture in said wall plate,



(5) a seal between said circumferential flange and the edge of the aperture in said wall plate to seal said filter tube to said suction chamber,

(6) a plug fitting into the bushing at the other end of said tube to hold the other tucked-in end of said sock therein, and having a recess at its outer end, the outer wall of said recess being supported in an aperture in said parallel plate, and

(7) a compression spring seated in said recess and pressed by said cover plate to urge said seal into sealing engagement with said wall plate.

4,428,839

SEPARATOR FOR OIL, GAS AND WATER

Evan E. Davies, Near Newbury, and Jiri R. Nebrensky, East Molesey, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Aug. 6, 1980, Ser. No. 175,405

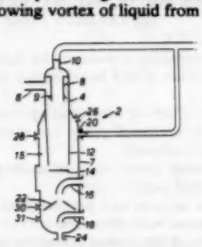
Claims priority, application United Kingdom, Aug. 9, 1979, 7927806

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—512.3 **6 Claims**

1. A cyclone separator suitable for separating a crude oil feed containing gas and water into (i) gas, (ii) an oil rich liquid and (iii) a water rich liquid, said cyclone separator comprising a vessel having:

(a) an inlet for the crude oil feed disposed so that the feed introduced under a pressure gradient is caused to form a downwardly flowing vortex of liquid from which the gas



separates, said inlet being controllably variable to provide a turndown capability (b) an upper outlet for the gas comprising a pipe extending downwardly into the vessel from the top thereof to a level below the inlet, the diameter of the outlet pipe being from 0.4 to 0.8 that of the vessel in the region of the inlet, (c) a downwardly extending hollow truncated cone whose apex angle is less than 20°, located below the inlet and disposed so that its internal surface provides a surface for the downwardly flowing vortex of liquid, the vessel having an enlarged lower portion, the walls of the vessel being spaced apart from the truncated cone to define therebetween a disengaging chamber, (d) an outlet for the discharge of gas from the disengaging chamber, (e) a baffle disposed transversely with respect to the truncated cone and located between the lower end thereof and sized so as to provide a gap between its edges and the walls of the vessel, the vessel being sized so as to allow the downwardly flowing liquid to separate into an oil rich liquid layer and a water rich liquid layer, (f) a first lower outlet for the oil rich liquid and located so as to withdraw liquid from below the lower end of the cone, (g) a second lower outlet for the water rich liquid layer and located below the first lower outlet to withdraw liquid from near the base of the vessel, and (h) a deflector located within the vessel at above and below the oil-water interface as to promote the upward movement of the oil and downward movement of the water.

4,428,840

ANIONIC AND CATIONIC REMOVAL OF COPPER FROM CYANIDE-CONTAINING WASTEWATER

Terrance I. Mudder, Piedmont, S. Dak., and Roy G. Neville, Redwood City, Calif., assignors to Homestake Mining Company, San Francisco, Calif.

Filed Jun. 16, 1982, Ser. No. 389,126

Int. Cl.³ C02F *1/62*

U.S. Cl. 210—717 **11 Claims**

1. A method for removing residual copper from cyanide-containing wastewater wherein the copper exists at least in part as cuprocyanide and cupricyanide anions, said method comprising:

adding ferric cation to the water in an amount equal to at least five times the stoichiometric amount required to form the ferric salts of the cuprocyanide and cupricyanide anions while maintaining the pH of the wastewater below about 5; and

after waiting at least one minute to allow sufficient time for said ferric cuprocyanide and ferric cupricyanide salts to form, adding a soluble precipitant which reacts to precipitate substantially all of the remaining excess ferric cation as well as the free cupric cation, whereby the ferric cuprocyanide and cupricyanide are removed by co-precipitation.

4,428,841

OFFSHORE POLLUTION PREVENTION

Uncas B. Favret, Jr., Covington, La., assignor to Engineering Specialties, Inc., Covington, La.

Continuation-in-part of Ser. No. 228,729, Jan. 27, 1981. This application Feb. 25, 1981, Ser. No. 237,976

Int. Cl.³ B01D *21/24*

U.S. Cl. 210—747 **26 Claims**

1. A surge settler for removing solid particles of about 50 microns or more and free oil droplets of about 50 microns or more from a fluid, comprising:

a surge settler vessel having a first partition defining an entrance chamber and a second partition defining an exit chamber said first and second partitions together defining an intermediate chamber;

inlet means for supplying said fluid to the entrance chamber;

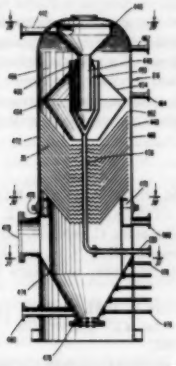
first passageway means for conducting said fluid from the entrance chamber to said intermediate chamber;

means for treating said fluid within the intermediate chamber including a plurality of corrugated plates each arranged generally parallel to one another and generally equally spaced from adjacent corrugated plates oriented at an angle of about 60° with respect to the horizontal,

each of said corrugated plates being generally planar having first and second generally linear side edges and first and second saw toothed end edges, the first side edges of said plurality of corrugated plates defining a first side of said means for treating said fluid with the second side edges of said plurality of corrugated edges defining a second side of said means for treating said fluid, said plurality of corrugated plates being generally rectangular;

means for withdrawing oil above said means for treating, said oil being released from said fluid while passing through said means for treating;

means for withdrawing gas above said means for treating, said gas being released from said fluid while passing through said means for treating;



means for withdrawing solid particles beneath said means for treating, said solid particles being released from said fluid while passing through said means for treating;

second passageway means for conducting said fluid from the second side of said means for treating to the exit chamber;

said first passageway means including first guide means for supplying said fluid generally evenly about said first side, said second passageway means including second guide means for withdrawing said fluid generally evenly about said second side, said first and second guide means each being comprised of a plurality of parallel guide plates generally equally spaced with respect to one another;

outlet means for withdrawing said fluid from the exit chamber.

4,428,842

WELL RESERVE PIT LIQUOR TREATMENT PROCESS

Sherre D. House, and Gary E. House, both of Rte. 2 Grass Valley Acres #13, Woodward, Okla. 73801

Filed Aug. 17, 1981, Ser. No. 293,698

Int. Cl.³ B01D *17/02*

U.S. Cl. 210—747 **9 Claims**

1. A process of dispensing water containing well liquor discharge comprising the steps of

(a) passing said well discharge liquor into a receptacle open at its top to the atmosphere, said receptacle containing said liquor between vertically and horizontally extending porous pit walls, said pit walls composed of earth particles, the particle distribution thereof being substantially the same at the top and the bottom of said walls, said walls extending above the ground adjacent thereto and said pit bottom extending below the level of said ground,

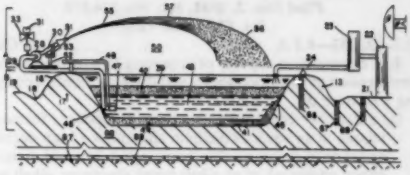
(b) separating said liquor into a lower water phase comprising principally water and a upper oily phase,

(c) withdrawing said water phase from said receptacle from a level in said liquor below the level of said upper oily phase,

(d) adding a biodegradable surface active agent to said liquor to reduce the surface tension thereof and forming an resultant mixture,

(e) pumping the resultant mixture to an elevated pressure and forming a stream therefrom and passing said stream through a nozzle and forming such stream into a first portion adjacent to said nozzle which is homogeneous and narrow and a second portion distant from said nozzle which is formed of separate discrete droplets, said stream being located above the top of one of said walls and

(f) evaporating a substantial portion of said liquor passed from said nozzle into said atmosphere and



(g) applying the remaining portion of said stream to a top portion of one of said walls,

(h) distributing the droplets of said stream on said wall and into interparticle spaces along the length of one of said pit wall and passing liquor in said droplets downward from the top of said wall into said pit wall without changing the particle size distribution of the particles in the top portion of said wall,

(i) discontinuing said application of said stream portion to said one of said walls and then applying a stream of said liquor to the top of another of said pit walls.

4,428,843

WELL WORKING COMPOSITIONS, METHOD OF DECREASING THE SEEPAGE LOSS FROM SUCH COMPOSITIONS, AND ADDITIVE THEREFOR

Jack C. Cowan, Lafayette, La.; Tommy Thrash, Littlefield, Tex., and Jerry R. Rayborn, New Orleans, La., assignors to Venture Chemicals, Inc., Lafayette, La.

Filed Jun. 1, 1981, Ser. No. 269,494

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ C09K *7/02, 7/06*

U.S. Cl. 252—8.5 C **13 Claims**

1. An oil base well-working fluid comprising a major proportion of oil and a minor proportion but sufficient to substantially lower the seepage loss of a hydrophobic, organophilic, water wettable fibrous material comprising cotton which has been treated to be hydrophobic and organophilic, said fibrous material having a particle size such that at least 90% by weight thereof present in a water suspension will pass through a 100 mesh screen.

5. A water base well-working fluid comprising a major proportion of water and a minor proportion but sufficient to substantially lower the seepage loss of a hydrophobic, organophilic, water wettable fibrous material comprising cotton which has been treated to be hydrophobic and organophilic, said fibrous material having a particle size such that at least 90% by weight thereof present in a water suspension will pass through a 100 mesh screen.

4,428,844

COMPACTED LOST CIRCULATION MATERIAL

Anthony P. Wagener, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jun. 29, 1981, Ser. No. 278,793

Int. Cl.³ C09K *7/02*

U.S. Cl. 252—8.5 LC **15 Claims**

1. In a bore hole drilling method wherein an aqueous drilling fluid is employed which includes a lost circulation material for arresting fluid loss in porous earth strata, the improvement which comprises said lost circulation material comprising a compressed, water dispersible pellet of ground paper, about 5

to 25% by weight water, and at least about 0.1% by weight of a water soluble, non-foaming anionic or nonionic surfactant and wherein said pellet has a bulk density of at least 20 pounds per cubic foot.

4,428,845

VISCOSIFIER AND FLUID LOSS CONTROL SYSTEM

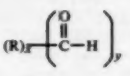
Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,876
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 A 11 Claims

1. A composition capable of imparting to aqueous systems a combination of pseudoplasticity and fluid loss control comprising a mixture of:

(a) a hydroxy containing aluminum component formed by mixing in an aqueous medium and under a high degree of agitation a water-soluble basic agent selected from the group consisting of an alkali metal aluminate, alkali metal hydroxide, ammonium hydroxide and mixtures thereof with a water-soluble acidic agent selected from an inorganic acid, aluminum chloride, aluminum sulfate, aluminum nitrate, their hydrates and mixtures thereof; at least one of said basic and acidic agents being an aluminum containing compound: said acidic and basic agents being reacted in a ratio such that the resultant product is capable of imparting to an aqueous medium a pH of from at least about 8 to about 10.3 in combination with

(b) a reaction product formed in an aqueous acidic medium having a pH of less than about 2.5 between a polyvinyl alcohol having a weight average molecular weight of at least 20,000 with from 0.01 to 0.1 percent of stoichiometry of a polyaldehyde of the general formula



wherein R is an organic radical capable of forming at least two covalent bonds with carbonyl groups, x is an integer of 0 or 1 and y is an integer of at least 2; wherein the amount of component (a) to component (b) is in a weight ratio capable of directly forming an aqueous system having from about 0.5 to 10 weight percent of component (a) and from about 0.3 to 5 weight percent of component (b) based on the weight of the water in the system.

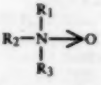
4,428,846

DRESSING AGENTS FOR SYNTHETIC FIBERS AND THEIR USE

Rolf Kleber, Neu-Isenburg, and Dieter Plabst, Altötting, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

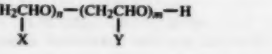
Filed Jul. 15, 1981, Ser. No. 283,721
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028016
Int. Cl.³ D06M 13/38, 13/46
U.S. Cl. 252—8.8 6 Claims

1. A preparation composition for synthetic fibers which contains 1 to 50 percent by weight of an amide oxide of the formula 1



(1)

in which R_1 denotes C_5–C_{22} alkyl or methyl or C_5–C_{22} alkenyl, R_2 denotes a group of the formula 2



(2)

R_3 denotes C_5–C_{22} alkyl, C_5–C_{22} alkenyl or a group of the formula 2, either X denotes methyl and Y denotes hydrogen or X denotes hydrogen and Y denotes methyl, n denotes numbers from 2 to 8, and m denotes numbers from 1 to 8, it being necessary that the total of n and m does not exceed 10.

4,428,847

ANODE STUD COATINGS FOR ELECTROLYTIC CELLS

Larry G. Boxall, and Dennis C. Nagle, both of Baltimore, Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Division of Ser. No. 225,066, Jan. 14, 1981, Pat. No. 4,354,918. This application Aug. 10, 1982, Ser. No. 406,753
Int. Cl.³ C25B 11/04, 11/12
U.S. Cl. 502—101 6 Claims

1. A method for the corrosion protection of steel anode studs, which method comprises providing said anode studs with a protective layer of a material selected from the group consisting of titanium diboride, zirconium diboride, titanium carbide, zirconium carbide, and mixtures thereof, prior to application of a carbonaceous anode material to said stud.

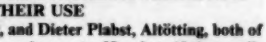
4,428,848

MOLYBDENUM DERIVATIVES AND LUBRICANTS CONTAINING SAME

Stephen A. Levine; Raymond C. Schlicht, both of Fishkill; Harry Chafetz, Poughkeepsie, all of N.Y., and James R. Whiteman, Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,780
Int. Cl.³ C10M 1/48
U.S. Cl. 252—32.7 HC 11 Claims

1. An oxidation inhibiting mixture for lubricants consisting of the combination of the product obtained by reacting at between 100 and 350 degrees C., a phosphosulfurized polyisoalkylene or alpha olefin adduct and an aqueous solution of a hexavalent molybdenum salt treated with 0.5 to 3 times the stoichiometric amount of acid required to neutralize said salt, said composition having the formula:



wherein R is an alkenyl radical having a molecular weight ranging from 56 to 5100; w is 1 to 3; x is 1 or 2; y is 1 to 3 and z is 0.05 to 2; with a zinc dialkyldithiophosphate in which the two components are present in weight ratios of 1:10 to 10:1, respectively.

4,428,849

LUBRICATING OIL WITH IMPROVED DIESEL DISPERSANCY

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 181,150, Aug. 25, 1980, Pat. No. 4,338,305. This application Apr. 19, 1982, Ser. No. 369,928
Int. Cl.³ C10M 1/40, 1/32
U.S. Cl. 252—33.4 2 Claims

1. A lubricating oil composition exhibiting improved dispersancy in a diesel engine comprising a hydrocarbon lubricating oil and an acid-treated, oil-soluble polyisobutenyl succinimide dispersant formed by reacting a polyisobutenyl succinic acid or anhydride with a polyalkylene amine, the polyisobutenyl having a number average molecular weight of 700 to 5,000, said dispersant being acid treated by heating a 40 to 60 wt% solution of the dispersant in mineral oil and adding thereto 0.1 to 0.5 mole of an organic acid with stirring for 15 minutes to 3 hours until the acid reacts in the system the organic acid having a pK of −10 to +5 and containing a C_9–C_{70} hydrocarbyl group, said organic acid a hydrocarbyl substituted maleic acid or a hydrocarbyl substituted sulfuric acid.

4,428,850

LOW FOAMING RAILWAY DIESEL ENGINE LUBRICATING OIL COMPOSITIONS

Benjamin H. Zoleski, Beacon, and Frank J. Gaetani, Poughkeepsie, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,672
Int. Cl.³ C10M 1/54
U.S. Cl. 252—42.7 18 Claims

1. In a railway diesel engine lubricant composition comprising a major amount of a mineral lubricating oil and, in an amount which tends to increase foaming, a metal detergent additive selected from the group consisting of overbased sulfurized calcium alkylphenolates and overbased alkaline earth metal sulfonates and which composition has a silicon content of less than about 10 parts per million by weight, the improvement comprising the composition containing in an amount to reduce foaming of an estolide of a hydroxy fatty acid having 10 to 24 carbon atoms.

7. In a railway diesel engine lubricant composition comprising a major amount of a mineral lubricating oil; in an amount which tends to increase foaming, a metal detergent additive selected from the group consisting of overbased sulfurized calcium alkylphenolates and overbased alkaline earth metal sulfonates; and at least one additive selected from the group consisting of a supplementary dispersant, a pour depressor and a silver friction modifier, and which composition has a silicon content of less than about 10 parts per million by weight, the improvement comprising the composition containing in an amount to reduce foaming of an estolide of a hydroxy fatty acid having 10 to 24 carbon atoms.

14. In a railway diesel engine lubricant concentrate composition comprising a minor amount of a mineral lubricating oil; in an amount which tends to increase foaming, a metal detergent additive selected from the group consisting of overbased sulfurized calcium alkylphenolates and overbased alkaline earth metal sulfonates; and at least one additive selected from the group consisting of a supplementary dispersant, a pour depressor and a silver friction modifier, and which composition has a silicon content of less than about 10 parts per million by weight, the improvement comprising the composition containing in an amount to reduce foaming of an estolide of a hydroxy fatty acid having 10 to 24 carbon atoms.

4,428,851

VOLATILE OIL COMPOSITIONS FOR METAL WORKING

Iwao Hisamoto, Suita; Chiaki Maeda, Kyoto, and Yukio Omure, Takatsuki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 1, 1981, Ser. No. 326,186
Claims priority, application Japan, Dec. 5, 1980, 55-172214
Int. Cl.³ C10M 1/30
U.S. Cl. 252—58 9 Claims

1. A volatile oil composition for use in metal working which does not remain on the surface of metal product after completion of mechanical treatment, comprising:

(i) a base oil having a boiling point up to 250° C. and selected from the group consisting of saturated or unsaturated aliphatic hydrocarbons, aromatic hydrocarbons, naphthene hydrocarbons and alkyl ethers of alkylene glycol, and

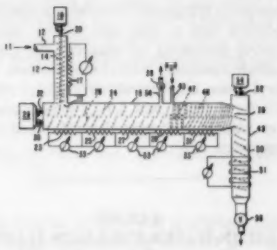
(ii) at least one liquid halogenated hydrocarbon having a boiling point of 35° to 125° C.

4,428,852

CONTINUOUS SYNTHESIS OF CHROMIUM DIOXIDE

Robert A. Covington, Jr.; Cecil L. Long, both of Wilmington, and David W. Williston, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 18, 1982, Ser. No. 340,302
Int. Cl.³ C01G 37/027
U.S. Cl. 252—62.56 8 Claims



1. A continuous chromium dioxide synthesis process which consists essentially of the steps of feeding through an extruder screw, while preheating, to just below the temperature at which incipient reaction occurs a viscous paste mixture comprising CrO_3 Cr_2O_3 and H_2O at elevated pressure to a reaction zone in the form of a twin-screw reactor, advancing the paste mixture in a starved (nonflooded) mode through the reactor, at elevated temperatures and pressures, the residence time being sufficient for the paste mixture to react to form CrO_2, continuously venting byproduct oxygen and steam, thereafter injecting water at high pressures into the reaction product to form a viscous CrO_2—H_2O slurry, and discharging the slurry from the reactor into a separate pressure letdown zone, wherein the slurry is cooled and depressurized to atmospheric pressure.

4,428,853

PROCESS FOR THE HEATING AND/OR THERMAL CONDITIONING OF A BUILDING BY MEANS OF A HEAT PUMP OPERATED WITH A SPECIFIC MIXTURE OF WORKING FLUIDS

Claude Ramet, Paris, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 25, 1982, Ser. No. 381,903
Claims priority, application France, Oct. 19, 1981, 81 19734
Int. Cl.³ C09K 5/04
U.S. Cl. 252—67 7 Claims

1. In a cyclic process for heat conditioning a building by means of a compression heat pump operated with a working fluid, the process comprising the repeated successive steps of (a) compressing a gas phase of a working fluid, (b) cooling the compressed gas phase of the working fluid obtained in step (a), in contact with a cooling fluid at a temperature from about 20° to 75° C., to form a condensed liquid phase of the working fluid, (c) expanding the liquid phase of the working fluid obtained in step (b) and vaporizing at least a portion of the expanded liquid phase of step (c) in contact with a heating fluid at a temperature from about −15° to +40° C. to reconstitute the gas phase of step (a), the improvement comprising using as the working fluid a composition of: (a) 95–80% by mole of

(i) R_{22} being monochlorodifluoromethane, or

(ii) R_{502} being by weight 48.8% chlorodifluoromethane and 51.2% chloropentafluoroethane; and (b) 5–20% by mole of

(i) R_{23} being trifluoromethane, or

(ii) R_{503} being by weight 40.1% trifluoromethane and 59.9% chlorotrifluoromethane.

4,428,854

ABSORPTION REFRIGERANT COMPOSITIONS FOR USE IN ABSORPTION REFRIGERATION SYSTEMS

Naonori Enjo, Suita, and Hideki Aomi, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 209,251, Nov. 21, 1980, abandoned.
This application Nov. 15, 1982, Ser. No. 441,773
Claims priority, application Japan, Nov. 30, 1979, 54-156093
Int. Cl.³ C09K 5/04
U.S. Cl. 252—69 2 Claims

1. An absorption refrigerant composition comprising 1,1,1,2-tetrafluoroethane and at least one organic solvent selected from the group consisting of tetraethylene glycol dimethyl ether, dimethylformamide, methyl ethyl ketone, methyl tetrahydrofurfuryl ether, ethyl tetrahydrofurfuryl ether and butyl tetrahydrofurfuryl ether, said 1,1,1,2-tetrafluoroethane being present in an amount of at least 40 wt.% based on the weight of the composition.

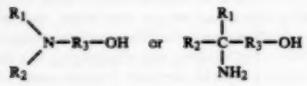
4,428,855

OIL-IN-WATER EMULSION FLUIDS

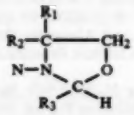
Derek A. Law, Pitman, and Joosup Shim, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,150
Int. Cl.³ C10M 3/26
U.S. Cl. 252—77 11 Claims

1. A composition comprising an emulsifiable high water content fluid consisting essentially of said fluid and a co-emulsifier comprising a water soluble alkanol amine or amines having the general formulas:



where R_1 and R_2 may be the same or different C_1 to C_4 alkyl groups and R_3 is a C_1 to C_4 alkylene group, mixtures thereof and mixtures of said alkanol amine and a heterocyclic amine having the general formula:



where R_1, R_2 and R_3 thereof are the same or different C_1 to C_4 alkyl groups.

4,428,856

NON-EVAPORABLE GETTER

Maya F. Boyarina, ulitsa Trefoleva, 15, kv. 92; Vladimir G. Vildgrube, Svetla novsky prospekt, 44, korpus 2, kv. 144, and Jury S. Sergeev, prospekt Morisa Toreza, 30, kv. 24, all of Leningrad, U.S.S.R.

Filed Sep. 30, 1982, Ser. No. 428,919
Int. Cl.³ H01J 7/18; H01K 1/56
U.S. Cl. 252—181.1 2 Claims

1. A non-evaporable getter containing titanium, a refractory metal selected from Groups V and VI of the Periodic System with a melting temperature of no less than 2500° C. and titanium hydride, the ratio of the components taken in percent by weight being as follows:

titanium: 50 to 98
refractory metal: 1.5 to 30
titanium hydride: 0.5 to 20.

4,428,857

AQUEOUS EMBRITTLING SOLUTION

Benjamin J. Taylor, Crawcrook, and Robert M. Lacy, Cramlington, both of England, assignors to Avery International Corp., Pasadena, Calif.

Division of Ser. No. 947,811, Oct. 2, 1978, Pat. No. 4,264,662.
This application Apr. 2, 1981, Ser. No. 250,196
Claims priority, application United Kingdom, Jun. 10, 1977, 41584/77
Int. Cl.³ C09K 3/00
U.S. Cl. 252—193 7 Claims

1. An aqueous solution for providing embrittled zones on a removable fibrous paper backing of an adhesive laminate comprising a facestock, an adhesive layer on the facestock, and a fibrous paper backing in contact with the adhesive layer, which solution comprises:

a. from about 1 to about 15 weight percent of a volatile acid embrittling agent capable of embrittling zones of the paper backing when the solution is applied to the backing and is dried by heating; and

b. an organic, brittle film-forming polymer capable of penetrating the paper backing and remaining in the embrittled zones of the paper backing after the solution is dried by heating to retard transfer of residual acid embrittling agent from the embrittled zones.

7. An aqueous solution for providing embrittled zones on a removable fibrous paper backing of an adhesive laminate comprising a facestock, and an adhesive layer on the facestock, the fibrous paper backing being in contact with the adhesive layer, which solution comprises from about 1 to about 15 weight percent of an acid selected from the group consisting of acetic acid, sulfuric acid and hydrogen chloride, from about 0.5 to about 3 weight percent of an organic thickener, from about 0.4 to about 1 weight percent of wetting agent, from about 0.5 to about 2 weight percent of anti-foam agent, and from about 1 to about 10 weight percent of organic, brittle film-forming polymer introduced as an emulsion, and the polymer is selected from the group consisting of polyvinyl chloride, polyvinyl alcohol, polyvinyl acetate, polystyrene acrylate, and thermoplastic and self-cross-linking acrylic polymers; the solution being such that when applied to zones of the backing and dried by heating, embrittled zones are formed on the backing and the polymer penetrates the backing and retards the transfer of residual hydrochloric acid from the embrittled zones.

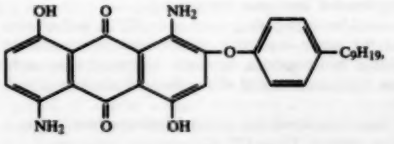
4,428,858

COMPOSITION BASED ON LIQUID CRYSTAL FOR ELECTRO-OPTICAL DEVICE

Jacques Cognard, Chezard; Trung H. Phan, Neuchatel, and Jurgen Markert, Ettingen, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Sep. 11, 1980, Ser. No. 186,138
Claims priority, application Switzerland, Oct. 2, 1979, 8863/79
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 252—299.1 7 Claims

1. A composition based on liquid crystal and designed for use in an electro-optical device, that contains as pleochroic dye an anthraquinone compound selected from the group consisting of



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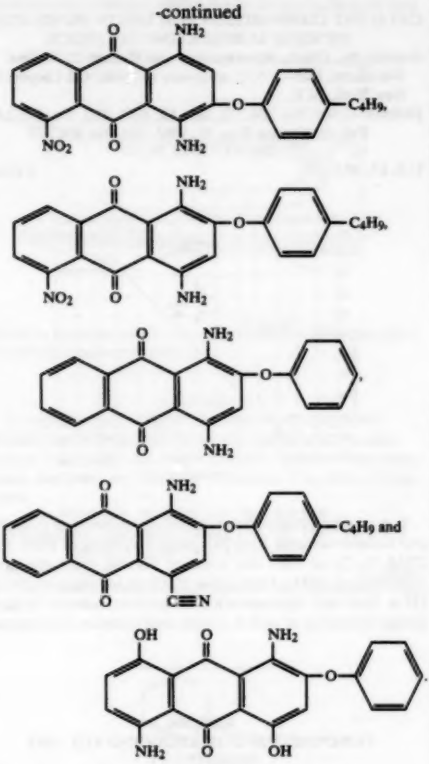


4,428,859

STABILIZER OF ORGANIC DYE LASERS

Tad H. Koch, and Robert J. von Trebra, both of Boulder, Colo., assignors to University Patents, Inc., Norwalk, Conn.

Filed Nov. 12, 1982, Ser. No. 441,324
Int. Cl.³ C09K *11/06*
U.S. Cl. 252—301.17 10 Claims

1. A composition of matter for use in a dye laser comprising an organic laser dye which degrade via free radical reaction and/or by reaction with singlet oxygen, and a singlet oxygen quencher.

4,428,860

POLYETHER THICKENERS FOR AQUEOUS SYSTEMS CONTAINING ADDITIVES FOR INCREASED THICKENING EFFICIENCY

Edward J. Panek, Trenton, and Pauls Davis, Gibraltar, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

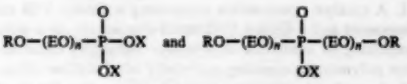
Continuation-in-part of Ser. No. 86,839, Oct. 22, 1979, Pat. No. 4,312,775. This application Apr. 27, 1981, Ser. No. 257,638
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.
Int. Cl.³ B01J *13/00*
U.S. Cl. 252—315.1 21 Claims

1. A polyether-based thickener for aqueous systems comprising in admixture:

A. a polyether having a molecular weight of about 1000 to about 75,000 which is prepared by reacting (1) ethylene oxide or (2) ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms, with at least one active hydrogen-containing polyhydric alcohol initiator and at least one glycidyl ether having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said glycidyl ether is present in the amount of about 1 to about 20 percent by weight based upon the total weight of said polyether

and about 10 to about 35 percent by weight based upon the total weight of said polyether-based thickener of:

B. a mixture of about 20 to about 50 percent of a water-soluble amine and about 80 to about 50 percent of an ethoxylated phosphate ester, or an ethoxylated phosphate ester, wherein said phosphate ester is selected from the group consisting of



and mixtures thereof, wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl or alkenyl groups having about 6 to 30 carbon atoms, and aryl or alkylaryl groups wherein said arylalkyl groups have about 6 to 30 carbon atoms; X is selected from the group consisting of the residue of hydrogen, ammonia, an amine, an alkali or alkaline earth metal and mixtures thereof; and n is a number from 1 to 50.

19. A composition comprising water and an effective thickening amount of the polyether-based thickener of claim 1.

4,428,861

MOLYBDENUM IV COMPOUNDS, PROCESS FOR PREPARATION THEREOF AND LUBRICANT COMPOSITIONS CONTAINING SAME

Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 115,456, Jan. 25, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,290
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E 23 Claims

1. A process for preparing bis(O,O-dialkylphosphorodithioato)oxomolybdenum(IV) compounds comprising reacting with H_2S a molybdenum(V) dithiophosphate or molybdenum(VI) dithiophosphate having the following respective general formulae:

$$[(RO)_2PS_2]_4Mo_2O_3$$

and

$$[(RO)_2PS_2]_2MoO_2$$

where R is a hydrocarbyl group having from 1 to 36 carbon atoms selected from alkyl, cycloalkyl, aryl or aralkyl and where the reaction is carried out in the presence of chloroform.

8. A lubricant composition comprising a major amount of an oil of lubricating viscosity or a grease formulated therefrom and a minor amount sufficient to provide antiwear and friction reducing properties thereto of a compound prepared as described in claim 1.

14. A compound prepared by reacting with H_2S in the presence of chloroform a molybdenum(V) dithiophosphate or molybdenum(VI) dithiophosphate having the following respective general formulae:

$$[(RO)_2PS_2]_4Mo_2O_3$$

and

$$[(RO)_2PS_2]_2MoO_2$$

where R is a hydrocarbyl group having from 1 to 36 carbon atoms selected from alkyl, cycloalkyl, aryl or aralkyl and where the reaction is carried out in the presence of chloroform.

4,428,862

CATALYST FOR SIMULTANEOUS HYDROTREATING AND HYDRODEWAXING OF HYDROCARBONS

John W. Ward, Yorba Linda, and Timothy L. Carlson, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 172,868, Jul. 28, 1980, abandoned. This application May 26, 1981, Ser. No. 267,247
Int. Cl.³ B01J *29/28, 29/34*
U.S. Cl. 502—77 54 Claims

1. A catalyst composition comprising a Group VIB metal component and a Group VIII metal component on a support comprising an admixture of a porous refractory oxide and a silica polymorph consisting essentially of crystalline silica.

3. A catalyst composition useful for promoting the simultaneous dewaxing and denitrogenation of hydrocarbons by reaction with hydrogen, which catalyst comprises a Group VIB metal component and a Group VIII metal component on a support comprising an intimate admixture of a porous refractory oxide and a silica polymorph consisting essentially of a crystalline silica molecular sieve.

11. A catalyst composition as defined in claim 1 or 3 wherein said silica polymorph has an X-ray diffraction pattern similar to ZSM-5.

4,428,863

ALUMINA COMPOSITIONS OF IMPROVED STRENGTH USEFUL AS CATALYST SUPPORTS

William E. Fry, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 6, 1982, Ser. No. 395,560
Int. Cl.³ B01J *21/04, 23/54*
U.S. Cl. 502—8 13 Claims

1. A high purity alumina low surface area catalyst support having improved crush strength and abrasion resistance comprising alumina and barium aluminate or barium silicate, wherein said barium aluminate or silicate is uniformly distributed as a binder and is present in an amount sufficient to provide from about 0.1% to about 1.0% by weight barium in the finished support.

4,428,864

COATING OF SUBSTRATES

James A. Cairns, Wantage; Edward S. Lane, Didcot; Thomas C. Prentice, Didcot; David L. Segal, Didcot, and David C. Sammon, Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 13, 1982, Ser. No. 408,037
Claims priority, application United Kingdom, Mar. 3, 1982, 8206271; Aug. 20, 1982, 8125514
Int. Cl.³ B01J *29/06*
U.S. Cl. 502—151 9 Claims

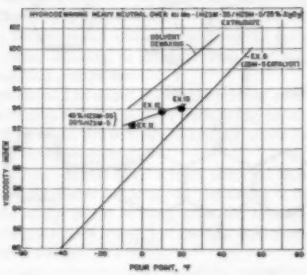
1. In a method of providing a substrate with a refractory oxide coating comprising contacting the substrate with a dispersion of a solid particulate phase in a liquid phase, subsequently followed by firing to produce the coating, the dispersion comprising at least a first and a second refractory oxide component, the improvement wherein the first refractory oxide component is present as the oxide or a hydrated form thereof and is obtained from a liquid or solid precursor therefor purifiable by distillation or recrystallization and constitutes part at least of the solid phase, and the second refractory oxide component is a liquid silica precursor purifiable by distillation and constituting part at least of the liquid phase.

4,428,865

CATALYST COMPOSITION FOR USE IN PRODUCTION OF HIGH LUBRICATING OIL STOCK

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 224,777, Jan. 13, 1981, Pat. No. 4,372,839. This application Sep. 29, 1982, Ser. No. 426,531
Int. Cl.³ B01J *29/28*
U.S. Cl. 502—77 3 Claims



1. A catalyst composition comprising a mixture of (1) at least one member selected from the group consisting of ZSM-5 and ZSM-11; (2) at least one member selected from the group consisting of ZSM-23 and ZSM-35; (3) an inorganic oxide, and (4) at least one hydrogenation component selected from the group consisting of nickel, cobalt, molybdenum and tungsten.

4,428,866

COMPOSITION FOR REDUCING FLY ASH RESISTIVITY

Richard L. Every, Lake Zurich; Franklin D. Lewandowski, Grayslake, and Jerome F. Lech, Crystal Lake, all of Ill., assignors to Dearborn Chemical Company, Lake Zurich, Ill.

Division of Ser. No. 25,327, Mar. 30, 1979, Pat. No. 4,352,747. This application Aug. 19, 1982, Ser. No. 409,686
Int. Cl.³ G01B *1/00*
U.S. Cl. 252—500 2 Claims

1. Composition of matter for reducing fly ash resistivity consisting essentially of equal parts by weight of tri-n-propylamine and sulfamic acid in aqueous solution.

4,428,867

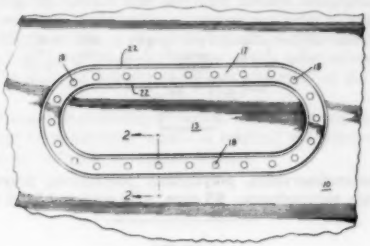
ELECTRICALLY CONDUCTIVE STRUCTURAL ADHESIVE

Michael G. Billias, Decatur, and Michael E. Borders, Marietta, both of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Nov. 2, 1981, Ser. No. 317,020
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—512 7 Claims

1. An adhesive for bonding two conductive members to withstand structural loads on the order of 5000 pounds per square inch without failure while conducting electrical currents on the order of 200,000 amps in a controlled path comprising a structural adhesive binder of thixotropic paste having a viscosity in the range of from 6,000 to 12,000 poise in which discrete aluminum particles are thoroughly mixed throughout in a concentration maintained within the range of approximately 9 to 13 percent by weight, the size of each said particle

being in the range of approximately 0.004 to 0.008 inch in cross-section and adapted to contact the faying surfaces of said



conductive members at all times when assembled to provide a permanently conductive adhesive.

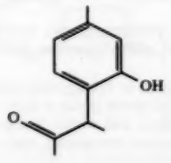
4,428,868

5-METHYL-2-(2'-OXO-3'-BUTYL)PHENOL AND PERFUME COMPOSITIONS COMPRISING SAME

Katsuhiro Takahashi, and Toshio Yoshida, both of Yokohama, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

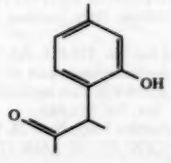
Filed Feb. 18, 1982, Ser. No. 349,908
Claims priority, application Japan, Feb. 20, 1981, 56-23872
Int. Cl.³ A61K 7/46; C07C 49/21
U.S. Cl. 252—522 R **3 Claims**

1. 5-methyl-2-(2'-oxo-3'-butyl)phenol represented by the formula



(I)

2. A perfume composition comprising an effective amount of 5-methyl-2-(2'-oxo-3'-butyl)phenol represented by the formula



(I)

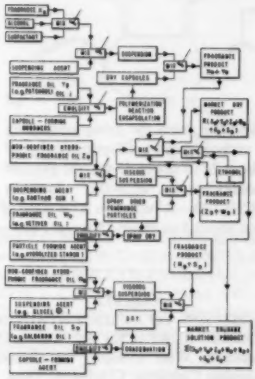
4,428,869

COLOGNE CONSISTING OF MICROCAPSULE SUSPENSION

Marina A. Munteanu, New York; Christine Cseko, Purchase, both of N.Y.; Edward S. Oltarzewski, Mercerville, N.J.; Jerome I. Lindauer, Hillsdale, N.J., and Donald A. Withycombe, Lincroft, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,731
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 A **15 Claims**

1. A cologne comprising particles of a composition consisting essentially of (a) from about 1 up to 10 parts by weight of a non-confined fragrance oil substance selected from the group consisting of non-confined hydrophobic fragrance oils and aqueous emulsions of fragrance oils; (b) from about 2 up to about 10 parts by weight of an entrapped fragrance oil capable of being released hydrolytically or by means of application of mechanical pressure, said fragrance oil being physically entrapped in a particulate material selected from the group consisting of gelatin, dextrin, gum acacia, urea formaldehyde polymers, modified food starch and synthetic polymers capable of being dissolved or decomposed hydrolytically, said solid material having a particle size of from about 3 microns up to about 400 microns, said physically entrapped fragrance oil being organoleptically compatible with said non-confined



hydrophobic fragrance oil or fragrance oil emulsion; and (c) from about 0.1 up to about 10 parts by weight of a suspending agent selected from the group consising of hydroxypropyl cellulose having a molecular weight of from about 50,000 up to about 800,000; xanthan gum, ethyl cellulose, silica, suspensions of finely divided clay in water, suspensions of an aqueous fluid-absorbing composition comprising water in soluble alkali salts of aqueous alkali saponified, gelatinized-starch-polyacrylonitrile graft polymers which contain gelatinized starch (GS) and saponified polyacrylonitrile (HPAN) in molar ratios of from about 1:1.5 to about 1:9 GS:HPAN, whereby after the cologne is intimately admixed with ethanol and water a fragrance is released at high fragrance intensity substantially evenly and uniformly over an extended period of time.

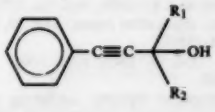
4,428,870

PERFUME COMPOSITION CONTAINING PHENYLETHYNYL CARBINOLS

Robert G. Eilerman, Merrick, N.Y.; Brian J. Willis, Ramsey, and John M. Yurecko, Jr., Bayonne, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Jan. 5, 1982, Ser. No. 337,251
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R **6 Claims**

1. A perfume composition comprising: a. one or more phenylethynyl carbinols having the structure:



wherein R_1 and R_2 is the same or different lower alkyl in an amount sufficient to impart fragrance thereto.

4,428,871

STRIPPING COMPOSITIONS AND METHODS OF STRIPPING RESISTS

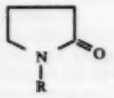
Irl E. Ward; Lisa G. Hallquist, and Thomas J. Hurley, all of Easton, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 304,789, Sep. 23, 1981, abandoned. This application Aug. 17, 1982, Ser. No. 408,052

Int. Cl.³ C11D *7/50, 7/32*

U.S. Cl. 252—542 **20 Claims**

1. A stripping composition comprising from about 55 to about 80 weight percent of a 2-pyrrolidinone compound of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms and hydroxyalkyl of 1 to 3 carbon atoms, from about 20 to about 45 weight percent of diethylene glycol monoalkylether of the formula $HOCH_2CH_2—O—CH_2CH_2—O—R^1$ wherein R^1 is alkyl of 1 to 4 carbon atoms, and from about 5 to about 25 weight percent polyethylene glycol.

4,428,872

COMPOSITION TO INHIBIT STAINING OF PORCELAIN SURFACES BY MANGANESE

Robert H. Callicott, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 234,535, Feb. 17, 1981, Pat. No. 4,374,572, which is a continuation of Ser. No. 28,613, Apr. 9, 1979, abandoned. This application Mar. 22, 1982, Ser. No. 360,269

Int. Cl.³ C11D *3/37, 17/00*

U.S. Cl. 252—550 **1 Claim**

1. A composition adapted to deliver ingredients which inhibit manganese soiling in the toilet bowl comprising:

A. about 5% of a material adapted to inhibit manganese staining, consisting essentially of copolymers of alternating ethylene and maleic acid anhydride having a molecular weight between about 20,000 and 100,000 atomic mass units;

B. about 50% of a water-soluble surfactant consisting essentially of a surfactant selected from the group consisting of the hypochlorite-stable alkyl sulfates and paraffin sulfonates; and

C. about 45% of optional ingredients selected from the group consisting of dyes, perfumes, isobornyl acetate, sodium chloride, sodium bromide and mixtures thereof;

wherein said composition is essentially free of manganese (II) oxidating material and phosphate esters.

4,428,873

ELECTROOPTICAL ELEMENT

Naohiro Murayama; Teruo Sakagami, and Masuhiro Shoji, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

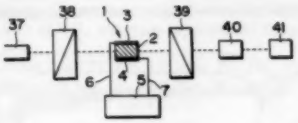
Filed Aug. 27, 1981, Ser. No. 297,016

Claims priority, application Japan, Aug. 30, 1980, 55-120196; Sep. 22, 1980, 55-131827

Int. Cl.³ G02F *1/07, 1/03*

U.S. Cl. 252—583 **5 Claims**

1. An electrooptical element exhibiting the Kerr effect which comprises a transparent solid member formed of a resin composition and at least a pair of electrodes on its surfaces, said resin composition comprising a low molecular weight polar substance having a Kerr type electrooptical effect and an organic polymer substance selected from the group consisting



of polymethacrylates, polystyrene, polysulfone, polyvinylchloride, polycarbonate, BS resin, ABS resin and MBS resin.

4,428,874

TRIPEPTIDE DERIVATIVES

Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed Mar. 25, 1981, Ser. No. 247,621

Int. Cl.³ C07C *103/52;* **C12Q** *1/36*

U.S. Cl. 260—112.5 R **6 Claims**

1. Tripeptide derivatives of the general formula

H—D—X—Y—Z—R I

wherein

(a)

X represents a cyclohexylglycyl, cyclohexylalanyl or cyclohexyltyrosyl group, and

Y represents an alanyl, α-aminobutyryl, valyl, norvalyl, leucyl, norleucyl, isoleucyl, prolyl or pipecolinoyl group, or

(b)

Y represents a phenylalanyl, phenylglycyl or tyrosyl group, and

X represents a cyclohexylglycyl, cyclohexylalanyl, cyclohexyltyrosyl, phenylalanyl or phenylglycyl group,

and wherein

Z represents an arginyl or lysyl group, and

R represents a chromogenic group which can be split off by enzymatic hydrolysis and which is capable of forming a colored or fluorescent compound, and salts thereof with acids.

4,428,875

COMPOUNDS OF DICHLORODIETHYLAMINOPHENYLALANINE WITH ANTI-TUMOR ACTIVITY

Augusto De Barbieri, Milan, Italy, assignor to Proter S.p.A., Opera, Italy

Continuation-in-part of Ser. No. 173,621, Jul. 30, 1980, Pat. No. 4,314,999, which is a continuation-in-part of Ser. No. 929,237, Jul. 31, 1978, Pat. No. 4,216,208. This application Oct. 15, 1981, Ser. No. 311,646

Claims priority, application Italy, Nov. 28, 1980, 26305 A/80

Int. Cl.³ C07C *103/52;* **A61K** *37/02*

U.S. Cl. 260—112.5 R **6 Claims**

1. Tripeptide formed from the aminoacids dichlorodiethylaminophenylalanine, para-fluorophenylalanine and methionine bonded together by CO-NH-peptide links.

4,428,876

PROCESS FOR ISOLATING SAPONINS AND FLAVONOIDS FROM LEGUMINOUS PLANTS

Junichi Iwamura, Kashiwara, Japan, assignor to Tokiwa Kanpo Pharmaceutical Co., Ltd., Japan

Filed Jun. 17, 1983, Ser. No. 505,566

Claims priority, application Japan, Aug. 19, 1982, 57-144298

Int. Cl.³ A23J *1/14;* **C07G** *3/00;* **C08B** *37/00*

U.S. Cl. 260—123.5 **8 Claims**

1. A process for isolating saponins and flavonoids from

leguminous plant which comprises extracting a part or the whole of the said plant with an aqueous alkaline solution, separating the extract from insoluble matters comprising fibrous materials, applying the extract on non-polar or slightly polar adsorbent resin to adsorb the saponins and flavonoids on the said resin, and treating the resin with a polar solvent to elute the saponins and the flavonoids adsorbed on the said resin.

4. The process according to claim 1, wherein the said extract separated from insoluble matters is acidified and precipitates formed are collected to recover proteins.

4,428,877

CIS-10-BROMO-E-HOMOEBURNANES

Csaba Szántay; Lajos Szabó; György Kalaus; Lajos Dancsi; Tibor Keve; Egon Kárpáti, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 56,395, Jul. 10, 1979, Pat. No. 4,315,011. This application Feb. 13, 1981, Ser. No. 234,577

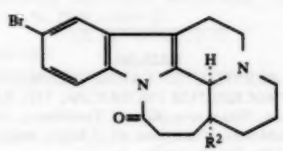
Claims priority, application Hungary, Jul. 12, 1978, RI 672; Jul. 12, 1978, RI 673; Jul. 12, 1978, RI 674; Jul. 12, 1978, RI 675

The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.

Int. Cl.³ C07D *459/00, 471/22*

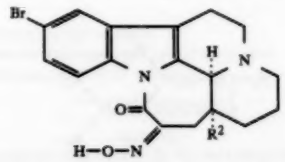
U.S. Cl. 260—244.4 **6 Claims**

1. A compound of the formula (XV)



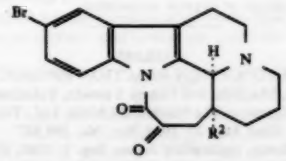
wherein R^2 is C_1 to C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

3. A compound of the formula (XVI)



wherein R^2 is C_1 to C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

5. A compound of the formula (XVII)



wherein R^2 is C_1 to C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4,428,878

PYRROLO[3,4-d][2]BENZAZEPINES

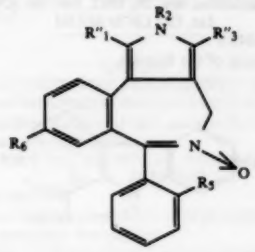
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 286,124, Jul. 23, 1981, Pat. No. 4,354,973, which is a continuation-in-part of Ser. No. 175,555, Aug. 5, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,664

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.7 **3 Claims**

1. A compound of the formula



wherein R_1'' and R_3'' are selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 alkenyl and C_3 to C_7 alkynyl; R_2 is hydrogen, lower alkyl, C_3 to C_7 alkenyl, C_3 to C_7 alkynyl, COO lower alkyl, —C_1 to C_6 lower alkyl —C—R_{21} and hydroxy C_2 to C_7 alkyl; R_{21} is hydroxy, lower alkoxy, amino or amino which is mono- or di-substituted by lower alkyl; R_5 is hydrogen or halogen and R_6 is halogen.

4,428,879

PYRROLO[3,4,-D][2]BENZAZEPINES

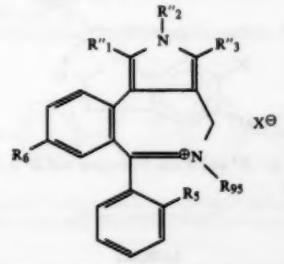
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 286,124, Jul. 23, 1981, Pat. No. 4,354,973, which is a continuation-in-part of Ser. No. 175,555, Aug. 5, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,787

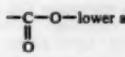
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.7 **3 Claims**

1. The compound of the formula



wherein R_1'' and R_3'' are selected from the group consisting of hydrogen, lower alkyl, C_3 to C_7 alkenyl and C_3 to C_7 alkynyl; R_2'' is hydrogen, lower alkyl, C_3 to C_7 alkenyl, C_3 to C_7 alkynyl, the group



the group -C_7 to C_6 lower alkyl-C_7-R_{21}, or hydroxy $C_2$to C_7alkyl; R_{95} is lower alkyl; R_5 is hydrogen or halogen; R_6 is

halogen; R_{21} is hydroxy, lower alkoxy, amino or amino which is mono- or di-substituted by lower alkyl"and $X^{\ominus}$ is the anion of an organic or mineral acid.

4,428,880

AZEPINO[4,5-d]INDOLE DERIVATIVES AND PREPARATION THEREOF

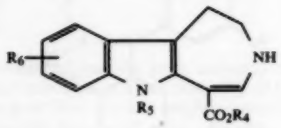
Martin E. Kuehne, Burlington, Vt., assignor to S.A. Omnichem, Louvain-la-Neuve, Belgium

Division of Ser. No. 260,415, May 4, 1981, Pat. No. 4,362,739. This application Sep. 29, 1982, Ser. No. 426,659

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.7 **7 Claims**

1. A compound of the formula



wherein

R_4 represents a lower alkyl group;

R_5 represents hydrogen, lower alkyl, or benzyl;

R_6 represents hydrogen, nitro, lower alkoxy, halo or hydroxy;

or an addition salt of said compound.

4,428,881

CONTROL OF UNWANTED VEGETATION WITH N-CARBAMYLINDOLINES

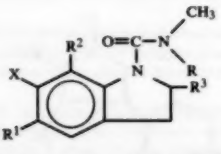
Loren W. Hedrich, Overland Park, and Ralph P. Neighbors, Olathe, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1977, Ser. No. 864,042

Int. Cl.³ C07D *27/38*

U.S. Cl. 548—491 **8 Claims**

1. A selective herbicidal compound having the structural formula



in which R, R^2, R^3 and X are hydrogen and R^1 is N,N-dimethylsulfamyl.

4,428,882

1-(AMINOALKYLAMINO)-5,8-DIHYDROXY-4-SUBSTITUTED-ANTHRAQUINONES

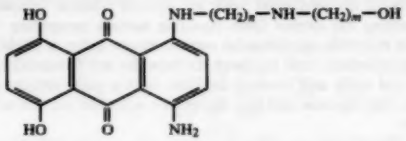
Keith C. Murdock, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 258,986, Apr. 24, 1981, abandoned, which is a division of Ser. No. 43,271, May 29, 1979, Pat. No. 4,275,009. This application Feb. 24, 1982, Ser. No. 351,804

Int. Cl.³ C07C *97/26*

U.S. Cl. 260—379 **3 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein n is an integer from 2 to 4, inclusive, and m is an integer from 2 to 4, inclusive; the leuco bases and tautomers thereof; and the pharmacologically acceptable acid-addition salts thereof.

4,428,883

NOVEL METHOD OF ADMINISTERING β-BLOCKERS AND NOVEL DOSAGE FORMS CONTAINING SAME

Anwar A. Hussain, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Mar. 6, 1981, Ser. No. 241,413

Int. Cl.³ A61K *27/00, 31/15, 31/40, 31/47, 31/135, 31/165, 31/435, 31/475, 47/00*; C07C *143/90*; C11D *1/28*; C09F *5/00*

U.S. Cl. 424—248.51 **61 Claims**

1. A method for eliciting a systemic therapeutic β-adrenergic blocking response in a warm-blooded animal, which comprises nasally administering to said animal a systemically therapeutically effective β-adrenergic blocking amount of dichloroisoproterenol, pronethalol, sotalol, oxprenolol, pindolol, metoprolol, nadoxolol, practolol, butoxamine, alprenolol, metalol, nifenalol, acebutolol, atenolol, bunolol, carteolol, labetalol, pamatolol, timolol, tiprenolol, xipranolol or bupranolol, or a nontoxic pharmaceutically acceptable salt thereof.

4,428,884

NOVEL α-SUBSTITUTED CARBOXYLAMIDOAMINE AND PROCESS FOR PRODUCING THE SAME

Yutaka Yasuda, Wakayama; Kiyoshi Tsuchihashi, Kainan, and Toshiro Nishimura, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

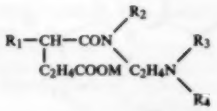
Filed Nov. 2, 1981, Ser. No. 317,224

Claims priority, application Japan, Nov. 10, 1980, 55-157837

Int. Cl.³ C09F *5/00, 7/00*; C11C *3/00*

U.S. Cl. 260—404.5 **8 Claims**

1. An α-substituted carboxylamidoamine having the formula I:



(I)

wherein R_1 is alkyl having 6 to 20 carbon atoms or alkenyl having 6 to 20 carbon atoms, R_2 is H or C_2H_4OH, R_3 and R_4 are H, C_2H_4COOM or C_2H_4OH, with the provisos that (1) when R_2 is C_2H_4OH, R_3 and R_4 are H or C_2H_4COOM, and (2) when R_2 is H, one of R_3 and R_4 is C_2H_4OH, and M is H, alkali metal, ammonium or organic ammonium.

4,428,885

ESTERIFICATION REACTION PRODUCTS

Yuzo Higaki, Machida, and Osamu Yamada, Yokohama, both of Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,567

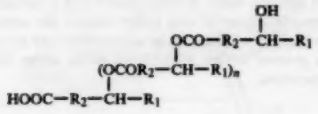
Claims priority, application Japan, Sep. 1, 1980, 55-119872

Int. Cl.³ C11C *3/02*

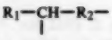
U.S. Cl. 260—410.9 N **1 Claim**

1. A composition which comprises a mixture of the esterifi-

cation reaction product between an intermolecular oligo-esterification carboxylic acid of 12-hydroxy stearic acid and-/or ricinoleic acid represented by the formula,



wherein radical



stands for the alkyl group of 12-hydroxy stearic acid or ricinoleic acid wherein R_1 is $-(CH_2)_5CH_3$ and R_2 is $-(CH_2)_{10}$ or $-(CH_2)_7CH{=}CHCH_2-$ and n is 0 or an integer of 1 or more and sterol and an esterification product of 12-hydroxy stearic acid and/or ricinoleic acid with sterol, the latter being included up to 50 weight %.

4,428,886

NOVEL INTERMEDIATES FOR THE PREPARATION OF α-HYDROXYCARBONYL COMPOUNDS

Ulrich Huber, Zurich, and Hans-Jakob Wild, Meilen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

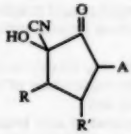
Division of Ser. No. 114,938, Jan. 24, 1980, Pat. No. 4,318,855. This application Jul. 30, 1981, Ser. No. 288,555

Claims priority, application Switzerland, Feb. 2, 1979, 1024/79; Dec. 14, 1979, 11104/79

Int. Cl.³ C07C *121/46*

U.S. Cl. 260—464 **8 Claims**

1. A compound having the general formula:



wherein:

R represents methyl or ethyl;

R′ represents hydrogen, methyl or ethyl; and

A is hydrogen, methyl or ethyl.

4,428,887

METHOD OF PRODUCING MONO-SUBSTITUTED TERMINAL DIESTERS

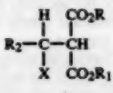
Jacob S. Tou, and Alfred A. Schleppnik, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 14, 1982, Ser. No. 398,060

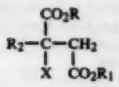
Int. Cl.³ C07C *120/00, 67/34*

U.S. Cl. 260—465 D **4 Claims**

1. A method for the preparation of mono-substituted terminal diesters of malonic acid having the structure



comprising reacting the corresponding substituted 1,2-diesters of the structure



with alkali metal hydride in the presence of organic solvent medium, wherein:

alkali metal = Na, K, Li;

X = CN, CO_2R, CO_2R_1;

R and $R_1 = C_{1-4}$ alkyl;

$R_2 = C_{1-6}$ alkyl, alkenyl, alkynyl; benzyl and C_{1-4} alkyl substituted benzyl.

4,428,888

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Jeffrey D. Robbins, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 16, 1982, Ser. No. 408,322

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 F **6 Claims**

1. A method for the preparation of N-phosphonomethylglycine which comprises the steps of

(1) reacting 1,3,5-tris(alkoxy- or aryloxy-substituted carbonylmethyl) hexahydro-s-triazine, with a substituted phosphorus compound having the formula PXYZ wherein X is a halogen, Y and Z are independently selected from the group consisting of halogen, alkoxy having from 1 to 10 carbon atoms, and aryloxy, in the presence of a relatively strong protic acid and a low molecular weight carboxylic acid,

(2) heating said reactants to a temperature ranging from about 10° to about 25° C. for a sufficient period of time to cause the formation of an N-phosphonomethylglycine ester, and

(3) hydrolyzing said N-phosphonomethylglycine ester to N-phosphonomethylglycine.

4,428,889

P-ALKOXYPHENYLTHIONOPHOSPHINE SULFIDE DIMERS

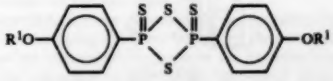
Bernard R. Belleau, Quebec, Canada, and Carlo Franchini, Bari, Italy, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 14, 1981, Ser. No. 263,793

Int. Cl.³ C07F *9/40*; C07C *103/52*

U.S. Cl. 260—927 R **10 Claims**

1. A p-alkoxyphenylthionophosphine sulfide dimer of the formula



II

in which each R^1 is the same and is a straight or branched chain alkyl group containing from four to six carbon atoms.

4,428,890

CYLINDRICAL EVAPORATIVE COOLER APPARATUS

Robert L. Harrell, Phoenix, Ariz., assignor to Hi-Lo Manufacturing, Inc., Avondale, Ariz.

Filed May 18, 1982, Ser. No. 379,314

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—29 **13 Claims**

1. Evaporative cooler apparatus, comprising, in combination:

base means, including means for containing a quantity of water;

pad frame means disposed on the base means, including

an outer pad frame extending continuously for substantially three hundred sixty degrees, and

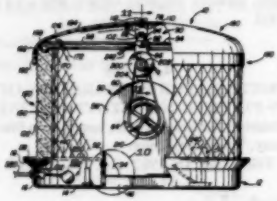
an inner pad frame spaced apart from the outer pad frame and extending continuously for substantially three hundred sixty degrees;

pad means disposed between the outer pad frame and the inner pad frame and extending continuously for substantially three hundred sixty degrees;

top means disposed on the pad frame means, including

a top element,

a trough in the top element extending substantially three



hundred sixty degrees and disposed above the pad means for receiving a flow of water,

a step extending circumferentially about the trough, and

a cap defining a top cover for the cooler apparatus and disposed on the circumferentially extending step;

means for providing a flow of water from the base means to the trough for saturating the pads;

blower means secured to the base means for providing a flow of air through the pad means; and

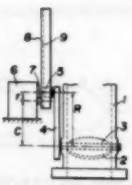
means for securing the top means to the blower means for securing the top means, the pad means, the blower means, and the base means together.

4,428,891

THROTTLE VALVE DRIVING MECHANISM

Takashi Ishida, Ohi, and Noboru Tominari, Tokyo, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,087
Claims priority, application Japan, May 25, 1981, 56-78052
Int. Cl.³ F16K *31/52*
U.S. Cl. 261—65 **2 Claims**



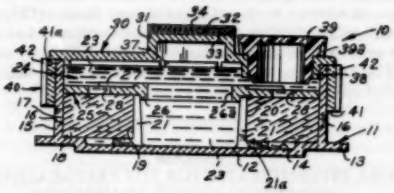
1. A throttle valve driving mechanism comprising a throttle valve having a shaft for angularly positioning the valve in an intake bore, an actuator having an actuator shaft and disposed near said valve shaft for determining the angular position of said throttle valve, and an oscillating slide block mechanism disposed between said actuator shaft and said valve shaft, said mechanism being adapted to ensure a higher resolution of the opening of the throttle valve in a range of rotation of said actuator corresponding to a range of small opening angles of the throttle valve, and to give a higher speed to the action of the throttle valve in a range of rotation of said actuator corresponding to a range of medium or larger opening angles of the throttle valve, said oscillating slide block mechanism including a throttle lever provided at one end thereof with a roller and connected to said valve shaft at its other end, the axis of said actuator shaft being substantially disposed along a straight line between said throttle valve shaft and said roller at the time when the throttle valve is fully closed and a certain distance away from the center of said roller toward the center of said valve shaft, and a rotatable lever attached to said actuator shaft having a groove within which said roller slides freely with small clearances.

4,428,892

HUMIDIFIER DEVICE

Martin Berliner, 68-37 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed Aug. 2, 1982, Ser. No. 404,603
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—99 **8 Claims**



1. In a humidifier device, the improvement comprising in combination:

a relatively flat cylindrical housing having apertures along its peripheral wall and having a central, concentric depressed portion on its bottom wall;

an absorbent ring mounted on said bottom wall and spaced above said depressed portion and covering said apertures, said ring being adapted to hold water or other evaporatable fluid;

a retaining ring secured to said housing and abutting the top wall of said absorbent ring for maintaining said absorbent ring in position;

an adjustable control ring rotably secured around said housing for regulating evaporation of said fluid through said housing apertures; and

a housing cover secured to said housing and spaced above said retaining ring and having a fluid filler opening and a stopper therefor.

4,428,893

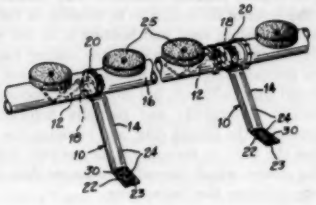
PIPE SUPPORT

Paul W. Cummings, Jr., Worcester, and David J. Mailhot, Rutland, both of Mass., assignors to Norton Co., Worcester, Mass.

Continuation-in-part of Ser. No. 421,207, Sep. 22, 1982, abandoned. This application Feb. 24, 1983, Ser. No. 469,329
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—122 **4 Claims**

1. Saddle support means to be attached to the floor of a liquid treatment system for carrying a plurality of gas distributing pipes together with their gas diffusers used in said liquid treatment system, each of said saddle means comprising a flexible inverted V shaped support means having corrosion resistant legs, a corrosion resistant sling support at the intersection of the legs of the V for securely engaging the pipe to the support, a corrosion resistant clamp means for securing the pipe to the sling of the support means, the free ends of the legs of said V support each having an integral foot means including plural spaced mounting holes for engaging the floor of said liquid treatment system, and corrosion resistant means engaging said foot means for permanently engaging the respective feet of said legs in adjusted position on said floor whereby a

plurality of said saddle support means may be fitted to each of the pipes and adjustably secured to the floor so that all of the



diffusers on said plurality of pipes in said liquid treatment system can be adjusted to a desired horizontal plane.

4,428,894

METHOD OF PRODUCTION OF METALLIC GRANULES, PRODUCTS OBTAINED AND A DEVICE FOR THE APPLICATION OF THE SAID METHOD

Gerard Bienvenu, Annemasse, France, assignor to Extramet, Annemasse, France

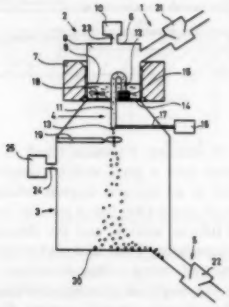
PCT No. PCT/FR80/00187, § 371 Date Aug. 21, 1981, § 102(e) Date Aug. 21, 1981, PCT Pub. No. WO81/01811, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 22, 1980, Ser. No. 296,270

Claims priority, application France, Dec. 21, 1979, 79 32115

Int. Cl.³ B22F *9/08*

U.S. Cl. 264—9 **12 Claims**



1. A method of production of metallic granules in which the granules are formed by solidification from molten metal, comprising passing the molten metal in a divided state through a purification bath, collecting said molten metal into a mass, separating, said molten metal from said bath by settling, forming a jet of molten metal by withdrawal from said mass, passing said molten metal through a vibrating orifice in order to divide the jet into individual drops and solidfying said drops by cooling so as to form granules.

4,428,895

COMPOSITE INORGANIC STRUCTURES AND PROCESS OF PRODUCING SAME

Earl Blasch, Albany, N.Y., and Robert Smith-Johannsen, Incline Village, Nev., assignors to Blasch Precision Ceramics, Inc., Schenectady, N.Y.

Continuation of Ser. No. 260,732, May 5, 1981, which is a continuation of Ser. No. 17,154, Mar. 2, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 423,736

Int. Cl.³ C04B *35/02*

U.S. Cl. 264—28 **16 Claims**

1. A process for making a composite inorganic article which comprises forming a first slurry composed of inorganic particles and a freeze-sensitive colloidal ceramic sol, forming at least a second slurry composed of diffferent inorganic particles having a different mass thermal coefficient of expansion than the inorganic particles contained in the first slurry and a freeze-sensitive colloidal ceramic sol which can be the same as or different from the colloidal sol used in said first slurry, bringing the slurries into physical contact with each other in a layered fashion without substantial intermixing thereof, simultaneously freezing the layered slurries in a cooling media while in contact with each other to form a unified structure that is characterized by an interfacial bond of sufficient strength to withstand temperatures of at least about 3000° F. and having high thermal shock resistance and wherein the difference between the two mass thermal coefficients of expansion, although sufficient to cause disruption of the interfacial bond resulting from conventional processes for producing composite inorganic articles, does not cause disruption of the interfacial bond at temperatures of at least about 3000° F.

4,428,896

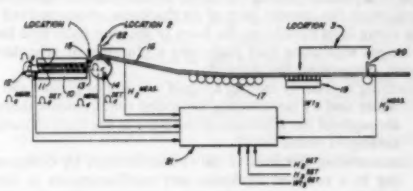
METHOD OF PRODUCING AN EXTRUDATE OF CONTROLLED SIZE AND SHAPE FROM A ROLLER DIE

James F. Stevenson, Hudson, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 30, 1982, Ser. No. 412,633

Int. Cl.³ B29F *3/02*

U.S. Cl. 264—40.1 **6 Claims**



1. A method of producing an extrudate from an extruder having means to vary output, a roller die having a plate die and a rotating roller, and a take away device which comprises the steps of:

operating the extruder at an initial output rate, rotating the roller at an initial speed, and operating the take-away device at an initial speed to produce an extrudate having initial dimensions of size and shape,

measuring said initial dimensions of the extrudate,

comparing said measured initial dimension values of the extrudate with the desired dimension values of size and shape for the extrudate and

controlling the size dimension of the extrudate by increasing or decreasing the linear weight of the extrudate by means of an increase or decrease in the extruder output rate of the extrudate relative to the take-away speed of the extrudate and controlling the shape of the extrudate by increasing or decreasing the extrudate thickness while the extrudate width is held substantially constant by decreasing or increasing the roller die speed.

4,428,897

PROCESS FOR PREPARING PARTICLE BOARD

Steven B. Lowenkron; Richard A. Prather, both of Houston, and Howard R. Steele, Baytown, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 23, 1982, Ser. No. 452,777

Int. Cl.³ B28B *7/04*

U.S. Cl. 264—109 **9 Claims**

1. In a process for the preparation of particle board wherein particles of material capable of being compacted are contacted with a polyisocyanate binder and the treated particles are

subsequently molded into boards by the application of heat and pressure utilizing metal caul plates or platens, the improvement which comprises employing, as the metallic surfaces which come into contact with said particle board during said application of heat and pressure, a metal selected from the group consisting of magnesium and zinc.

4,428,898

U-SHAPED PLASTERBOARD

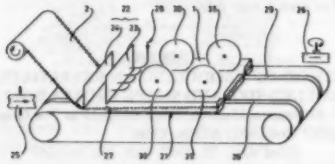
Yves Buck, Clermont en Beauvaisis, and Adrien Delcoigne, Chantilly, both of France, assignors to Isover Saint-Gobain, Neuilly, France

Division of Ser. No. 118,099, Feb. 4, 1980, Pat. No. 4,361,995. This application Jan. 4, 1982, Ser. No. 336,904

Claims priority, application France, Feb. 5, 1979, 79 02922

Int. Cl.³ D01D *5/20*

U.S. Cl. 264—167 **8 Claims**



1. Process of manufacture of construction elements in the form of a plate including expanded reinforcements distributed throughout the greater part of its thickness, characterized in that along lines parallel to the faces of the plto form fold lines or hinges separating said plate into a plurality of articulated panels, comprising the steps of:

forming a plate by casting a liquid mixture of plaster and of water and by introducing expanded requirements therein throughout the thickness of the plate in the form of curled entangled fibers;

concentrating portions of the reinforcements by compressing to a reduced thickness said reinforcements to form fold lines separating said plate into a plurality of articulated panels;

evolving the setting of the plaster; and

maintaining the reinforcement in position along these fold lines during the evolution of the setting of the plaster until the plaster hardens sufficiently to retain the reinforcement in said position.

4,428,899

METHOD OF MAKING SOCKETED PIPE-FITTINGS OF SYNTHETIC PLASTICS MATERIAL BY INJECTION MOULDING, APPARATUS FOR CARRYING OUT SAID METHOD

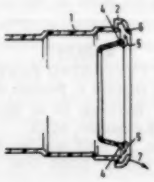
Dirk van Manen, De Bente 10, 7751 GM Dalen, Netherlands

Filed Jun. 18, 1982, Ser. No. 390,045

Claims priority, application Netherlands, Jun. 22, 1981, 8103011

Int. Cl.³ B29C *1/14, 27/00;* B29D *23/02;* B29F *1/00*

U.S. Cl. 264—249 **13 Claims**



1. A method of making a pipe fitting of synthetic plastics material by injecting moulding, said pipe fitting comprising a socket including means for receiving a sealing ring, characterized by, prior to the injection moulding process, placing a sealing ring in slightly pinched condition with reduced outer diameter at the level of the means to be formed on the socket for receiving the sealing ring, and holding it in this position during the injecting moulding process, the sealing ring being isolated from the moulding cavity during the injection moulding process; and after sufficient, but incomplete cooling of the moulded socket, temporarily and partially deforming the means for receiving the sealing ring, and releasing the sealing ring to permit the same to spring into the partially deformed ring receiving means, which thereafter reassume their original shape, thereby gripping the sealing ring.

4,428,900

METHOD OF FORMING A PIPE OF ORIENTED THERMOPLASTICS POLYMERIC MATERIAL

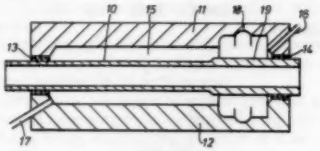
Jack L. Riley, Sutton Coldfield; Michael C. Lock, Streetly, and Jeremy R. Goddin, Coventry, all of England, assignors to Yorkshire Imperial Plastics Limited, Yorkshire, England

Continuation of Ser. No. 42,228, May 4, 1979, abandoned, which is a continuation of Ser. No. 835,897, Sep. 23, 1977, abandoned. This application Jun. 1, 1981, Ser. No. 268,769

Claims priority, application United Kingdom, Sep. 23, 1976, 76/39505

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—526 **8 Claims**



1. A method of forming a tubular blank of thermoplastic polymeric material into a pipe which comprises a tubular section connected to an integral coaxial tubular socket, the internal diameter of said socket being greater than the internal diameter of said tubular section, and the thermoplastic polymeric material constituting both said socket and said tubular section being oriented, using a female mould having a first portion defining the required external configuration of said socket, an axially adjacent second portion defining the required external configuration of said tubular section, and a third portion defining a transition between said first and second portions,

said method comprising:

forming the tubular blank such that it comprises a first longitudinal portion having a greater wall thickness than a second longitudinal portion thereof, said first longitudinal portion having a smaller external diameter than the external diameter of said socket, and said second longitudinal portion having a smaller external diameter than the external diameter of said tubular section;

positioning the first longitudinal portion of said blank within the first portion of said mould with the second longitudinal portion of said blank being positioned within the second portion of said mould;

heating the entire tubular blank, whilst so positioned within said mould, substantially uniformly to a temperature at which deformation of the thermoplastic polymeric material of the tubular blank will cause orientation of the polymer molecules, said heating being conducted by contacting the blank with liquid at a suitable temperature, including circulating the heating liquid between the blank and

the mould and circulating the heating liquid through the bore of the blank;

applying fluid pressure to the bore of the heated tubular blank to expand the tubular blank radially outwards against the mould whilst orientating the polymer molecules, the first longitudinal portion of the tubular blank being radially expanded into engagement with the first portion of the mould to form said socket, and the second longitudinal portion of the tubular blank being radially expanded into engagement with the second portion of the mould to form said tubular section;

cooling the expanded tubular blank, whilst the expanded tubular blank remains still pressed against said mould by the fluid pressure, to a temperature at which the expanded tubular blank will not revert to the original shape of said tubular blank when the fluid pressure is removed;

then removing the fluid pressure from the bore of the cooled expanded tubular blank; and

then removing the expanded tubular blank from the mould.

4,428,901

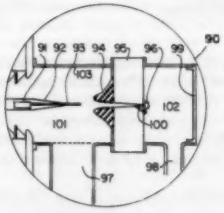
PRODUCTION AND UTILIZATION OF ION CLUSTER ACCELERATION BY MEANS OF POTENTIAL WELL

Willard H. Bennett, 1609 Glengarry Dr., Cary, N.C. 27511

Continuation-in-part of Ser. No. 149,163, May 14, 1980, Pat. No. 4,363,779, which is a continuation-in-part of Ser. No. 871,868, Jan. 24, 1978. This application Dec. 24, 1980, Ser. No. 219,619

Int. Cl.³ G21B *1/00*; G21G *4/02*

U.S. Cl. 376—105 **18 Claims**



1. The method of concentrating a beam on a target comprising:

directing a high-energy pulsed beam comprising bursts of electrons, in a first direction, toward the target,

pinching said beam for a first portion of its length which portion is spaced from the target, said beam having a self-magnetic field, said pinching being effected by the self-magnetic field of the beam,

further pinching the beam, over a second portion of its length which second portion extends from the first portion to the target, by limiting the size of the self-magnetic field around the beam to a smaller cross-section than the cross-section of the first-named field while increasing the ion concentration in the beam so that the small-size cross-section of the self-magnetic field plus the increased ion concentration will cause the beam to be pinched to a smaller cross-section than resulted from the first pinching step,

forming a cluster of ions in the beam, the concentration of ions in such cluster being increased during said further pinching step, and

impacting a target with said cluster of ions to produce a shower of particles,

said step of forming a cluster of ions comprising providing the electron beam with ions so that electrons will be deflected inwardly as they move along the beam to form a potential well in which ions are concentrated to form a cluster that will approach the velocity of the electron beam.

4,428,902

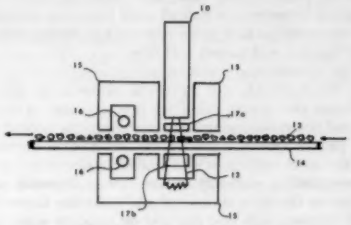
COAL ANALYSIS SYSTEM

Kenneth M. Murray, 1425 N. Nash St., Arlington, Va. 22209

Filed May 13, 1981, Ser. No. 263,049

Int. Cl.³ G21K *4/00*; G21C *17/00*

U.S. Cl. 376—156 **9 Claims**



1. An on line coal analysis coal analysis system for continuously analyzing a moving quantity of coal which comprises;

an electron accelerating means for providing an electron beam not greater than 19 Mev;

an electron beam converting means positioned so as to convert the electron beam from the electron accelerating means into an x-ray beam for the purpose of irradiating a portion of said moving quantity of coal;

at least one x-ray beam monitoring means positioned so as to monitor the x-ray beam from the electron beam converting means subsequent to passage of said x-ray beam through said portion of said moving coal;

a radioactive detection means downstream of said x-ray monitor a predetermined distance for providing signals characteristic of the detected radioactivity;

an analyzer means to sort the signals from the radioactivity detection means according to their amplitude.

4,428,903

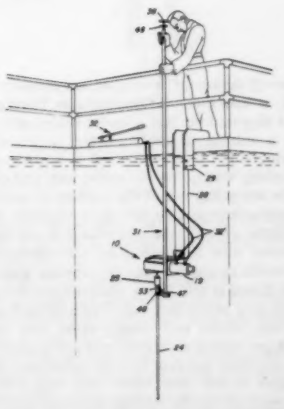
FUEL ROD FISSION GAS CRIMPING ARRANGEMENT AND METHOD

James E. Kasik; Frank D. Qurnell, and David K. Dennison, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 13, 1981, Ser. No. 253,090

Int. Cl.³ G21C *19/20*

U.S. Cl. 376—261 **11 Claims**



1. Apparatus for sealingly crimping a malleable sleeve over

a hole in a nuclear fuel rod while said rod is submerged below the water level in a nuclear reactor service pool, comprising:

a pair of jaws including a fixed and a movable jaw which together define at least a pair of mutually spaced circumferential jaw ridges;

means for selectively positioning said pair of jaws below said water level adjacent a wall of said pool;

means for maneuvering said sleeve and said fuel rod into position between said pair of jaws such that said hole is located between said jaw ridges and said sleeve surrounds said fuel rod and covers said hole;

a source of hydraulic pressure; and

means for applying said hydraulic pressure to urge said movable jaw against said fixed jaw, said pair of mutually spaced jaw ridges being effective to impress a corresponding pair of mutually spaced, circumferential depressions on the outer surface of said malleable sleeve and to raise corresponding mutually spaced, circumferential sealing ridges on the inner surface of said malleable sleeve in gas tight contact with said fuel rod on opposite sides of said hole;

whereby the leakage of fission gas from said fuel rod through said hole is contained.

4,428,904

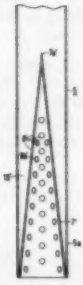
BLOW-OFF DEVICE FOR LIMITING EXCESS PRESSURE IN NUCLEAR POWER PLANTS, ESPECIALLY OF THE BOILING WATER REACTOR-TYPE

Roland Kühnel, Dietzenbach, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 926,140, Jul. 19, 1978, abandoned. This application Oct. 30, 1981, Ser. No. 316,843

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—283 **2 Claims**



1. In a blow-off device for limiting excess pressure in nuclear power plants, at least one condensation tube having an upper inlet end and disposed so that a lower outlet end thereof is immersed in a volume of cooling water in a condensation chamber having a gas cushion located in a space above the volume of cooling water, and the upper inlet end of the condensation tube extending out of the volume of cooling water and being connectible to a source of condensing steam or a steam-air mixture, a perforated tube received coaxially within the condensation tube for smoothing the condensation and defining therewith an annular gap, said annular gap forming a ring chamber closed at said lower outlet end of the condensation tube, and said perforated tube being closed at the end thereof disposed within said condensation tube and facing toward said upper inlet end thereof, said perforated tube comprising wall portions forming storage chambers distributed over the length of said tube outlet end, said wall portions having edges over which the cooling water flows, said storage chambers being formed by said ring chamber, and said edges defining respective holes formed in said perforated tube whereby a spraying action multiplying the heat-transfer surface between the cooling water and a flow of the steam is releasable at said overflow edges when cooling water received in said storage chambers is alternatingly depleted and replenished due to pressure and water-level fluctuation within the condensation tube induced by the condensation.

4,428,905

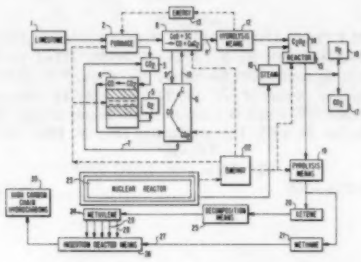
SYSTEM FOR THE PRODUCTION OF KETENE AND METHYLENE FROM LIMESTONE UTILIZING A SOLID ELECTROLYTE ELECTROLYSIS CELL

D. Colin Phillips, Monroeville; Werner S. Emmerich, Churchill Borough; Arnold O. Isenberg, Forest Hills, and Michael G. Down, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 22, 1981, Ser. No. 266,672

Int. Cl.³ G21C *15/00*

U.S. Cl. 376—323 **16 Claims**



6. A process of converting inorganic carbonate mineral material to organic high carbon chain hydrocarbon material, utilizing nuclear reactor energy, comprising the steps of:

(1) thermally decomposing inorganic carbon containing carbonate mineral material at a temperature over about 700° C., to produce a product mixture comprising CaO and CO_2,

(2) feeding the CO_2 produced in step (1) as a fuel in a high temperature electrolysis cell comprising an anode, a cathode, and a solid electrolyte therebetween capable of allowing migration of $O^{=}$ ions therethrough from the cathode to the anode, where CO_2 at the cathode is converted into CO and $O^{=}$,

(3) catalytically decomposing the CO produced in step (2) at a temperature over about 450° C., to produce carbon particles,

(4) reacting the carbon particles produced in step (3) from CO_2, with the CaO produced in step (1) at a temperature over about 1,600° C., to produce CaC_2 and CO, and then

(5) water hydrolyzing the CaC_2 produced in step (4) to produce C_2H_2 and heat energy which is removed, and then

(6) reacting the C_2H_2 produced in step (5) with excess steam, at between about 250° C. and about 475° C., in the presence of a catalyst effective to provide gases which upon condensation yield CH_3COCH_3, and then

(7) high temperature pyrolyzing the CH_3COCH_3 produced in step (6), at between about 600° C. and about 800° C., to produce ketene and methane,

(8) decomposing the ketene from step (7) to produce methylene, and

(9) reacting the methylene produced in step (8) with methane produced in step (7), to provide a product which is reacted with additional methylene in a manner effective to cause methylene insertion chain reactions and provide hydrocarbon materials containing at least three carbon atoms; where all the reactants except water and steam are derived from the carbonate starting material, and the heat

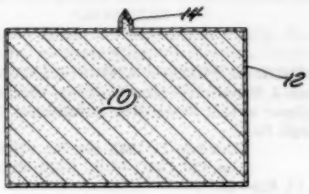
energy required for the electrolysis in step (2) and the pyrolyzing in step (7) is supplied, at least in part, by a nuclear reactor.

4,428,906

PRESSURE TRANSMITTING MEDIUM AND METHOD FOR UTILIZING SAME TO DENSIFY MATERIAL

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Apr. 28, 1982, Ser. No. 372,563
Int. Cl.³ B22F 3/14
U.S. Cl. 419—48 **24 Claims**



1. A method for consolidating material (10) of metallic and nonmetallic compositions and combinations thereof to form a densified compact (10') of a predetermined density wherein a quantity of such material (10) which is less dense than the predetermined density is subjected to a pressure-transmitting medium (18) to which external pressure is applied to the medium to cause a predetermined densification of the less dense material by hydrostatic pressure applied by the medium in response to the medium being substantially fully dense and incompressible and capable of fluidic flow at least just prior to the predetermined densification, characterized by utilizing a pressure transmitting medium (18) of a rigid interconnected skeleton structure (26) which is collapsible in response to a predetermined force and a fluidizing material (28) capable of fluidity and supported by and retained within the skeleton structure (26), and applying pressure to collapse the skeleton structure (26) to produce a composite (18') of structure fragments (26') dispersed in the fluidizing material (28') with the composite (18') being substantially fully dense and incompressible and rendered fluidic through the fluidized material (28) at the predetermined densification of the compact (10').

16. A pressure-transmitting medium (18) of the type for encapsulating a quantity of material (10) which is less dense than a predetermined density by applying pressure thereto to form a densified compact (10') of the predetermined density, said pressure-transmitting medium (18) characterized by a rigid interconnected skeleton structure (26) which is collapsible in response to a predetermined force, and fluidizing means (28) capable of fluidity and supported by and retained within said skeleton structure (26) for forming a composite (18') of skeleton structure fragments (26') dispersed in said fluidizing means (28') in response to the collapse of said skeleton structure (26) at said predetermined force and for rendering said composite (18') substantially fully dense and incompressible and capable of fluidic flow at the predetermined density of said compact (10').

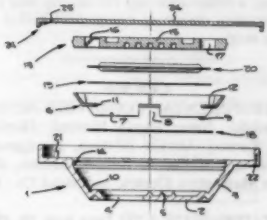
4,428,907

DETECTOR FOR DETECTING AIR COMPONENTS

Berend Heijenga, Sleen; Hubertus E. Hilbrink, Apeldoorn, and Henri F. Klaij, Enschede, all of Netherlands, assignors to Nederlandse Centrale Organizatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Feb. 23, 1981, Ser. No. 237,492
Int. Cl.³ G01N 31/06, 31/22
U.S. Cl. 422—61 **24 Claims**

1. In a detector for detecting the presence of given components in air, comprising a housing provided with preformed air passages, air pervious carrier means containing at least a first reagent, said carrier means being arranged such that the air to be tested is to be passed through said carrier means in order to expose said first reagent to the air, which first reagent is influenced by the components to be detected, a second reagent present within said housing such that when said first carrier means is contacted with said second reagent a color reaction may be brought about depending on whether the first reagent has been influenced or not, the improvement comprising: a housing which forms, in the operative condition, an integral unit, an air- and liquid-tight container having an easily rupturable wall arranged within the housing and in close proximity to



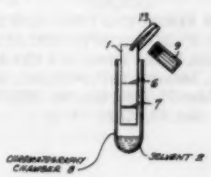
said carrier means for the first reagent, said container being filled with non-contaminated liquid, an inwardly yieldable wall portion situated near said container and adapted to be contacted with said container, said container, said yieldable wall and said carrier being each of generally planar configuration and spaced parallel arrangement with respect to one another, and a plurality of piercing pins cooperating with said yieldable wall portion so that, when pushing inwards said wall portion, the container wall is ruptured by said pins so as to moisten said reagent carrier means with the liquid from said container, said liquid bringing said second reagent into contact with said first reagent.

4,428,908

RADIONUCLIDE QUALITY CONTROL TEST KIT

Sheldon J. Ashley, and Meredith A. Ashley, both of 147-15 84th Rd., Jamaica, N.Y. 11435

Continuation-in-part of Ser. No. 159,825, Jun. 16, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,748
Int. Cl.³ G01N 33/00, 31/08
U.S. Cl. 422—61 **6 Claims**



1. A radionuclide quality control test kit for determining the radiochemical purity of radiopharmaceutical compounds, said test kit comprising

a disposable chromatography chamber;

a cap for closing said chromatography chamber to provide a saturated solvent atmosphere, said cap being removably affixed to said chamber;

a premeasured amount of solvent solution in the chamber, said solvent solution being dyed in accordance with a color code;

a disposable test strip having spaced opposite first and second ends, said first end being immersible in the solvent solution

in said chamber upon being spotted by an insoluble radiopharmaceutical to be tested in a single solvent system to enable said solvent solution to ascend said strip to said second end whereat soluble radiochemical impurities of the radipharmaceutical migrating to said second end are radiologically countable to permit computation of such impurities, said test strip having a length between said first and second ends, a first line marked thereon in parallel relation with said first and second end equidistantly from said ends and a second line marked thereon in parallel relation with said first and second ends at approximately 1/5 the length of said strip from said first end whereat said test strip is spottable at said second line and said strip is cuttable along said first line to divide it into two strips of equal length for testing for impurities;

a vial having a removable cap for storing said strip; and

a color-indicating desiccant component sealed in said vial with said strip.

4,428,909

ENVIRONMENTAL CONDITION SENSOR

Tomohiro Yashiki, Nara; Fumio Hosomi, Hirakata; Yasuo Wakahata, Katano; Atsushi Nishino, Neyagawa; Kiyotaka Wasa, Nara, and Masazumi Katase, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

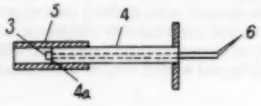
PCT No. PCT/JP80/00323, § 371 Date Aug. 19, 1981, § 102(e) Date Aug. 19, 1981, PCT Pub. No. WO81/01880, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 24, 1980, Ser. No. 296,267

Claims priority, application Japan, Dec. 26, 1979, 54-171073

Int. Cl.³ G01N *3/16*

U.S. Cl. 422—95 **12 Claims**



1. A temperature sensing device, comprising:

a hollow, tubular element having an open end for gases which forms an aperture, having a composition comprising electrolytic manganese dioxide (γ-MnO_2), a compound oxide of zinc, manganese and iron (Zn-Mn-FeO_x), and alumina cement ($mAl_2O_3.nCaO$); and

a temperature sensor disposed within said tubular element.

4,428,910

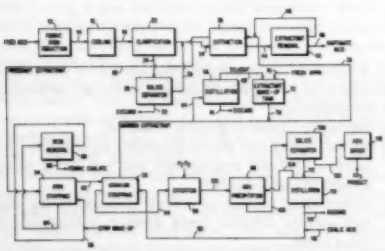
PROCESS FOR STRIPPING URANIUM FROM AN ALKYL PYROPHOSPHORIC ACID

Ralph E. Worthington, Winter Haven, and Alex Magdics, Lakeland, both of Fla., assignors to Prodeco,Inc., Mulberry, Fla.

Filed May 27, 1981, Ser. No. 267,473

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **23 Claims**



1. A process for stripping uranium from a pregnant organic extractant comprising an extractant having a high affinity for tetravalent uranium dissolved in a substantially water-immiscible organic diluent, said organic extractant containing tetravalent uranium, comprising stripping said organic extractant with a stripping solution comprising an aqueous solution of an alkali metal or ammonium oxalate to strip tetravalent uranium from said organic extractant into said stripping solution, and separating said organic extractant from said stripping solution containing stripped tetravalent uranium.

4,428,911

METHOD OF PRECIPITATING URANIUM PEROXIDE

Thomas J. Hardwick, O'Hara Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sep. 27, 1982, Ser. No. 423,658

Int. Cl.³ C01G *43/01*; C22B *60/02*

U.S. Cl. 423—16 **15 Claims**

10. A continuous process for the precipitation of uranium values from an aqueous basic solution containing the uranium as the uranyl tricarbonate ion, $UO_2(CO_3)_3^{=\,=}$, which comprises the steps:

(a) adding sulfuric acid to the said aqueous basic solution to produce an acidic pH suitable to convert the uranyl tricarbonate complex to the uranyl ion, UO_2^{++}, and carbon dioxide;

(b) introducing sufficient hydrogen peroxide to the acidified solution to precipitate the uranium as uranium peroxide ($UO_4.XH_2O$), and

(c) introducing a sufficient additional quantity of the aqueous basic solution to maintain a pH of between about 3.0 and about 4.5 in the solution while the uranium peroxide is precipitating.

4,428,912

REGENERATION OF CHLORIDIZING AGENT FROM CHLORINATION RESIDUE

James E. Reynolds, Golden, and Alan R. Williams, Denver, both of Colo., assignors to Public Service Company of New Mexico, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 50,549, Jun. 20, 1979, Pat. No. 4,288,414, which is a continuation-in-part of Ser. No. 873,400, Jan. 30, 1978, Pat. No. 4,159,310. This application Jul. 27, 1981, Ser. No. 287,219

Int. Cl.³ C01F *7/22*

U.S. Cl. 423—132 **11 Claims**

1. In a process for the chlorination of a feed material selected from the group consisting of clay associated with coal and bauxite comprising leaching said feed material with a chlorinating agent to chlorinate said aluminum and to produce a residue containing a chloride selected from the group consisting of alkali and alkaline earth metal chloride, the improvement comprising adding sulfuric acid to the residue under conditions to cause the conversion of at least a portion of the alkali or alkaline earth metal chlorides to their environmentally inert sulfate forms and to form a dilute hydrochloric acid and further comprising at least one step of (a) using said dilute hydrochloric acid as a pre-chloridizing agent prior to said chlorination of (b) using said dilute hydrochloric acid as a binder for pelletizing said feed material prior to said chlorination.

4,428,913
PERFLUOROAMMONIUM SALT OF HEPTAFLUOROXENON ANION

Karl O. Christe, Calabasas, and William W. Wilson, Simi Valley, both of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

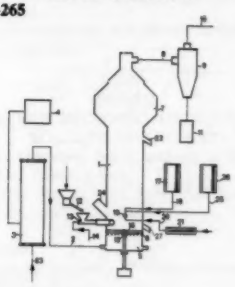
Filed Jun. 24, 1982, Ser. No. 391,786
Int. Cl.³ C01B 23/00
U.S. Cl. 423—262 1 Claim

1. NF_4XeF_7.

4,428,914
PROCESS FOR MAKING SODIUM PERCARBONATE GRANULES

Jean Brichard, Vilvoorde, and Jean-Claude Colery, Brussels, both of Belgium, assignors to Interox, Brussels, Belgium

Continuation of Ser. No. 863,700, Dec. 23, 1977. This application Jun. 1, 1982, Ser. No. 384,101
Int. Cl.³ C01B 15/10
U.S. Cl. 423—265 11 Claims



1. In a process for the production of sodium percarbonate granules in a fluidized bed comprising the steps of:

(a) impregnating sodium percarbonate seeds with an aqueous solution of hydrogen peroxide and an aqueous solution of sodium carbonate, and simultaneously

(b) evaporating water from the impregnating seeds in a fluidized bed dryer in the presence of at least one condensed phosphate, the improvement comprising providing sodium hexametaphosphate as said condensed phosphate and dissolving said condensed phosphate in at least one of said solutions.

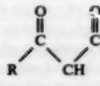
4,428,915
PROCESS FOR RECOVERING PHOSPHATE VALUES FROM PRECIPITATES FORMED DURING THE NEUTRALIZATION OF IMPURE WET PROCESS PHOSPHORIC ACID

Gregory W. Grynkewich, West Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

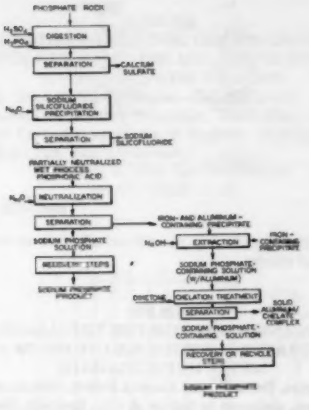
Filed Oct. 25, 1982, Ser. No. 436,225
Int. Cl.³ C01B 25/30
U.S. Cl. 423—312 11 Claims

9. The process for removing aluminum values from a phosphate-containing solution, which comprises:

(a) treating a phosphate solution containing soluble aluminum values with a sufficient amount of a chelant selected from the group consisting of di(lower alkyl) beta-diketones of the formula:



wherein R and R' are individually selected from lower alkyl groups having 1 to 4 carbon atoms to form and to precipitate a metal chelate complex containing at least a portion of said aluminum values present in said solution; and



(b) separating said precipitated metal chelate complex from said phosphate solution.

4,428,916
METHOD OF MAKING α-SILICON NITRIDE POWDER

Katsutoshi Komeya, Yokohama; Hiroshi Inoue, Kawaguchi; Shigeru Matake, and Hiroshi Endo, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Company Limited, Kawasaki, Japan

Continuation of Ser. No. 878,452, Feb. 16, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,231
Claims priority, application Japan, Feb. 18, 1977, 52-16037
Int. Cl.³ C01B 21/068
U.S. Cl. 423—344 15 Claims

1. A method of manufacturing α-silicon nitride which comprises the steps of:

(a) premixing 1 wt. part silica powder, 0.4–4 wt. parts carbon powder and 0.005–1.0 wt. part of at least one powder component selected from the group consisting of silicon nitride, silicon carbide and silicon oxynitride; and

(b) heating said mixture at from 1350° C. to 1550° C. in a non-oxidizing atmosphere containing at least one of nitrogen or ammonia, for a time sufficient to effect the formation of α-silicon nitride.

4,428,917
PURIFICATION OF SILICON

Edward J. Lahoda, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

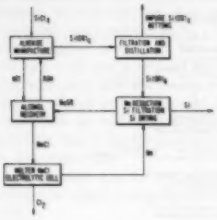
Filed May 24, 1982, Ser. No. 381,092
Int. Cl.³ C01B 33/02
U.S. Cl. 423—350 10 Claims

1. In a process for purification of silicon, the specific improvement comprising the steps of:

(a) formation of silicon tetrahalide;

(b) reacting said silicon tetrahalide with a lower alcohol thus forming a silicon alkoxide;

(c) separating the silicon alkoxide in a purified form; and



(d) chemically reducing the silicon alkoxide to recover a purified silicon.

4,428,918

PROCESS AND PLANT FOR THE PREPARATION OF CONCENTRATED AQUEOUS SOLUTIONS OF ALKALI METAL HYPOCHLORITE

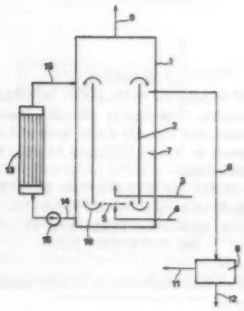
Jean Verlaeten, Brussels, and Jacques Brahm, Grimbergen, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Dec. 1, 1981, Ser. No. 326,273

Claims priority, application France, Dec. 22, 1980, 80 27409

Int. Cl.³ C01B *11/04*

U.S. Cl. 423—473 **12 Claims**



11. In a process for the preparation of concentrated aqueous solutions of alkali metal hypochlorite according to which an aqueous solution of alkali metal hypochlorite is added with an aqueous solution of alkali metal hydroxide, the resultant liquid is treated with a gas containing chlorine and a suspension of crystals of alkali metal cloride in an aqueous solution of alkali metal hypochlorite is recovered, the improvement comprising:

continuously and simultaneously feeding both the aqueous solution of alkali metal hypochlorite and the aqueous solution of alkali metal hydroxide into a tubular reaction chamber having an open upper part and located in an enclosure,

continuously introducing the gas into the lower part of the reaction chamber as an upwardly directed gas stream in order to crystallise alkali metal chloride by reaction of chlorine of the gas with alkali metal hydroxide of the aqueous solution of alkali metal hydroxide and to subject both aqueous solutions and the suspension resulting from said reaction to upwards displacement by gasosiphon up to the upper part of the reaction chamber,

continuously recovering the suspension by drawing-off out of the upper part of the reaction chamber and separating it into at least two fractions,

recycling one of the fractions, outside the upwardly directed gas stream, and within the enclosure, to the base of the reaction zone,

removing out of the enclosure the other fraction, and

recovering separately the concentrated aqueous solution of alkali metal hypochlorite and the crystals of alkali metal from the removed fraction, the recovered crystals from the removed fraction being the primary source of recovered crystals.

4,428,919

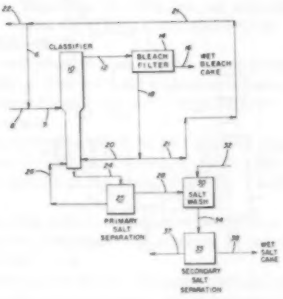
METHOD FOR SEPARATING PARTICULATE CALCIUM HYPOCHLORITE AND SODIUM CHLORIDE

David A. Stermole, Bedford Heights; Clifford E. Loehr, Norton, and Duk S. Chun, Uniontown, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 3, 1982, Ser. No. 374,130

Int. Cl.³ C01B *11/06*

U.S. Cl. 423—474 **15 Claims**



1. In the process of producing calcium hypochlorite wherein an aqueous slurry of calcium hypochlorite particles and larger separable sodium chloride crystals is produced and wherein the particles of calcium hypochlorite and crystals of sodium chloride are separated, the improvement which comprises:

(a) introducing aqueous slurry containing such calcium hypochlorite particles and larger sodium chloride crystals into a staged upward flow elutriator-classifier at about the midpoint of such classifier, said aqueous slurry being introduced into said classifier in a manner such that an initial preferential directional flow of said slurry is avoided, the uppermost stage of said classifier having a larger diameter than the lowermost stage and the upward fluid velocity in the lowermost stage being higher than the upward fluid velocity in the uppermost stage,

(b) introducing elutriating fluid comprising an aqueous solution substantially saturated with calcium hypochlorite and sodium chloride into the lowermost stage of said classifier,

(c) removing a first slurry in which the solid phase is predominantly calcium hypochlorite particles from the uppermost stage of said classifier,

(d) separating said first slurry into a wet cake of calcium hypochlorite solids and bleach mother liquor,

(e) removing from the lowermost stage of said classifier a second slurry in which the solid phase is predominantly sodium chloride crystals,

(f) separating said second slurry into a wet cake of sodium chloride solids and salt mother liquor,

(g) washing said wet cake of sodium chloride solids with an aqueous wash liquor unsaturated in calcium hypochlorite, thereby to dissolve substantially all of the calcium hypochlorite solids present in said wet cake, and

(h) separating washed sodium chloride solids from the resulting calcium hypochlorite-enriched wash liquor.

4,428,920

PROCESS OF PRODUCING POTASSIUM TETRAFLUORO ALUMINATE

Heinrich Willenberg, Garbsen; Karl-Heinz Heilberg, and Heinz Zschiesche, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,840

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116469

Int. Cl.³ C01F 7/54, 7/04

U.S. Cl. 423—465 14 Claims

1. A process for producing potassium tetrafluoro aluminate having a melting point not exceeding about 575° C., comprising the steps of:

reacting an aqueous solution of fluoro aluminum acid with an amount of an aqueous solution of a potassium compound which is less than the stoichiometrically required amount calculated with respect to the total charge of reactants to produce a suspension of potassium tetrafluoro aluminate; and

separating the potassium tetrafluoro aluminate from the resulting suspension.

4,428,921

PROCESS FOR RECOVERY OF SULFUR FROM SO_2-CONTAINING GAS

Yasuhiko Seike, Odawara, Japan, assignor to Sumitomo Heavy Industries, Ltd, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,382

Claims priority, application Japan, Nov. 5, 1980, 55-155313

Int. Cl.³ C01B 17/04

U.S. Cl. 423—569 2 Claims

1. In a process for recovery of sulphur from an SO_2-containing gas which comprises the steps of:

(a) introducing an SO_2-containing gas mixed with additional oxygen into an SO_2 reduction reactor filled with solid carbonaceous materials so as to reduce a portion of the SO_2 and form H_2S, vaporous sulphur and COS, and separating said vaporous sulphur therefrom by condensation to form a first gaseous mixture and to thereby recover elemental sulphur;

(b) introducing said first gaseous mixture into a Claus reactor to further produce a vaporous sulphur by Claus reaction; and

(c) introducing the effluent gas from the Claus reactor to a condenser for separating vaporous sulphur therefrom by condensation to form a second gaseous mixture and to thereby further recover elemental sulphur, and discharging the second gaseous mixture to the outside of the system; the improvement comprising measuring the concentration of SO_2, H_2S and COS contained in said second gaseous mixture; computing the $(H_2S+COS)/SO_2$ molar ratio on the basis of said measured concentrations; and controlling the amount of oxygen supplied to the SO_2-containing gas of step (a) in accordance with the computed molar ratio to maintain the $(H_2S+COS)/SO_2$ molar ratio of said first gaseous mixture at a level of about 2.

4,428,922

PROCESS FOR MANUFACTURING HYDROGEN PEROXIDE

Quentin G. Hopkins, Charleston, W. Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 14, 1982, Ser. No. 378,146

Int. Cl.³ C01B 15/02

U.S. Cl. 423—588 1 Claim

1. An improved process for producing hydrogen peroxide by the alternate reduction and oxidation of an alkylated anthraquinone as the working material dissolved in a solvent to constitute a liquid working solution which is reduced with hydrogen gas while flowing through a hydrogenation catalyst supported as a fixed bed at a sufficient rate to entrain the hydrogen gas as bubbles in a continuous liquid phase of working solution wherein the improvement comprises dispersing the hydrogen gas in the working solution with a static mixer prior to contacting the hydrogenation catalyst.

4,428,923

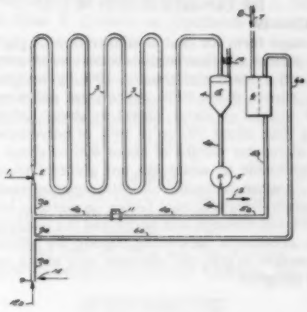
CONTINUOUS PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE ACCORDING TO THE ANTHRAQUINONE PROCESS

Wolfgang Kunkel, Kleinostheim; Jörg Kemnade, Kelkheim-Fischbach, and Dietrich Schneider, Buchschlag, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,347

Int. Cl.³ C01B 15/02

U.S. Cl. 423—588 7 Claims



1. In a process for the production of hydrogen peroxide by the anthraquinone process including a step of the catalyst hydrogenation with hydrogen or a hydrogen containing gas using a working solution having palladium black suspended therein and employing a meandering tube system as the reaction space at a temperature up to 100° C. and a pressure up to 15 bar, the improvement comprising carrying out the hydrogenation in a loop reactor made of tubes of the same nominal width and which are arranged vertically or horizontally and are connected by tube elbows of the same nominal width at a flow velocity in the tubes of at least 3 m/sec.

4,428,924

PREPARATION FOR DIAGNOSTIC RADIOLOGY

Arthur R. Millington, Blackburn, England, assignor to Linton Medical Services Limited, Blackburn, England

Continuation-in-part of Ser. No. 874,154, Feb. 1, 1978, Pat. No. 4,215,103. This application Apr. 14, 1980, Ser. No. 139,980

Claims priority, application United Kingdom, Feb. 2, 1977, 4319/77

The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.

Int. Cl.³ A61K 49/04

U.S. Cl. 424—4 7 Claims

1. A method of producing a preparation for diagnostic radiology, the preparation, when taken into the body of a user, releasing a gas that expands within the body of a user, comprising:

placing a mixture containing a radio opaque substance and a carrier in a pressure vessel, the radio opaque substance being present in a quantity sufficient for diagnostic radiology;

adding a non-toxic gas to the pressure vessel;

agitating the mixture for a period of time sufficient to produce a substantially uniform suspension of radio opaque substance in the carrier and to obtain a predetermined level of dissolved gas within the mixture, the level being

sufficient to cause release of the gas within the body of a user;

controlling the temperature and pressure within the vessel so that the temperature is below ambient and the pressure is elevated; and

withdrawing the preparation from the vessel for administration to a patient in such a way that the concentration of dissolved gas does not fall below a level at which gas is released within the patient when the preparation is ingested.

4,428,925

SUSTAINED RELEASE GLYCEROL TRINITRATE

Alec D. Keith, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 332,127, Dec. 18, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 425,282

Int. Cl.[3] **A61K** *9/22, 9/24, 9/32*

U.S. Cl. 424—19 **5 Claims**

1. A dosage form for oral administration of glycerol trinitrate to a patient which comprises a core containing glycerol trinitrate and a coating of about 5–10% by weight of an expandable, above about 90% hydrolyzed polyvinyl alcohol molecular weight of about 75,000 to about 150,000, lattice containing from about 1% up to 10% of polyethylene glycol having a molecular weight of about 400 to about 4000, said coating permeable to water but not glycerol trinitrate, said dosage form when contacted with the aqueous medium of the patient's gastro-intestinal tract taking up water in said core by passage of water through said lattice and the resultant increase in osmotic pressure in the core expanding the lattice and making it permeable to glycerol trinitrate, said lattice retaining its structural integrity.

4,428,926

SUSTAINED RELEASE PROPRANOLOL SYSTEM

Alec D. Keith, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 332,129, Dec. 18, 1981, abandoned. This application Sep. 28, 1982, Ser. No. 425,280

Int. Cl.[3] **A61K** *9/22, 9/24, 9/32*

U.S. Cl. 424—19 **5 Claims**

1. A dosage form for oral administration of propranolol to a patient which comprises a core containing propranolol and a coating of about 5–10% by weight of an expandable above about 90% hydrolyzed polyvinyl alcohol, molecular weight of about 75,000 to about 150,000, lattice containing from about 1% up to 10% of polyethylene glycol having a molecular weight of about 400 to about 4000, said coating permeable to water but not propranolol, said dosage form when contacted with the aqueous medium of the patient's gastro-intestinal tract taking up water in said core by passage of water through said lattice and the resultant increase in osmotic pressure in the core expanding the lattice and making it permeable to propranolol, said lattice retaining its structural integrity.

4,428,927

MASTICATORY SOFT ELASTIC GELATIN CAPSULES AND METHOD FOR THE MANUFACTURE THEREOF

William R. Ebert; Foo S. Hom, and Warren W. Kindt, all of Clearwater, Fla., assignors to R. P. Scherer Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 262,406, May 11, 1981, abandoned. This application May 7, 1982, Ser. No. 376,115

Int. Cl.[3] **A23G** *3/30;* **A61K** *9/68, 9/48*

U.S. Cl. 424—37 **7 Claims**

1. A chewable, non-toxic, filled, one piece, soft elastic gelatin capsule comprising, in combination, a shell formed from a formulation of a soluble component of gelatin, water, and a plasticizer selected from the group consisting of glycerin and sorbital, and of an insoluble component of a masticatory substance, and a fill material contained within said shell, said shell formulation being capable of being formed into said shell with said fill material therein, an insoluble chewable residue being formed from said insoluble component upon chewing of said capsule, the size of said residue substantially retaining its size and chewing consistency during chewing, the relative proportions of said soluble component and said insoluble masticatory substance component being such that the size and chewing characteristics of said chewable residue are attained.

4,428,928

DENTIFRICE PREPARATIONS COMPRISING CALCINED KAOLIN ABRASIVES

Joseph C. Muhler, Howe, and Mark S. Putt, Fort Wayne, both of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Jun. 28, 1982, Ser. No. 393,046

Int. Cl.[3] **A61K** *7/16, 7/18*

U.S. Cl. 424—49 **1 Claim**

1. In a method for reducing the incidence of dental abrasion caused by regular application to the teeth of a dentifrice preparation comprising as a cleaning and polishing agent calcined kaolin, the improvement consisting of employing therewith at least about 6% talc by weight of the mixture as a modifier.

4,428,929

NEW ORAL CLEANSING MEDIUM FOR WEARERS OF PARTIAL AND FULL DENTURES

William E. Wicheta, P.O. Box 5280, Austin, Tex. 78763, and Alvin L. Boyd, P.O. Box 5280, Austin, Tex. 78749

Filed Mar. 4, 1983, Ser. No. 457,066

Int. Cl.[3] **A61K** *7/16, 7/22*

U.S. Cl. 424—49 **1 Claim**

1. A new and improved chemical formula prepared from and of the following ingredients, listed in descending quantitative analytical order of

Water	84.152%
Methyl salicylate	6.27%
Methyl cellulose	3.6%
Triethanolamine	2.89%
Sodium lauryl Sulfate	2.4%
Food Color (Green - a combination of FD&C Yellow #5 and FD&C Blue #1	.45%
Saccharin	.19%
Methyl parabens	.048%
	100.000%

that can be produced as a transparent gel, or as a translucent gel, and that is intended to be used primarily as a cleansing preparation in paste form of a gel consistency for application to all inner oral cavity surfaces and tissues of the hard and soft palates, the gums and the tongue of persons who wear partial or full dentures and dental prostheses, said formula is to be used when the dentures have been removed from the mouth, for maximum application and benefits directly to mouth tissues, particularly those areas covered or obscured by the dentures, the said formula, having no harsh chemicals or abrasives in its component parts which are intended to remove dental plaque, tartar and stains, and is instead a gentle, stimulating formula prepared especially to benefit sensitive mouth tissues by thorough foaming and cleansing and removal of irritating food particles, denture adhesive residue, sloughed-off dead cells and tissues and most halitosis-causing bacteria, and thereby helping to elimate the so-called "denture breath," and the said formula has the further benefits of providing a breath-freshener, and of introducing an immediate feeling of freshness and a pleasant, tingling, zesty taste in the mouth, that will linger after mouth tissues are cleansed, and is designed and formulated to be a complete oral cavity cleanser, especially of the soft tissue, to be used instead of commercial denture and dental cleansers for improved oral hygiene practices by den-

ture and dental appliance wearers, and its gentle formulation, even if applied directly to healthy natural teeth and all oral tissue surfaces, will do no harm, but will cleanse and freshen the mouth parts, and formula is designed for mass market availability and sale directly to public without special prescription.

4,428,930

COMPOSITIONS AND METHOD FOR REDUCING ELUTION OF THERAPEUTIC AGENTS FROM TEETH

Robert W. H. Chang, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 303,206, Sep. 18, 1981, Pat. No. 4,366,146, which is a division of Ser. No. 176,680, Aug. 11, 1980, Pat. No. 4,304,.66, which is a division of Ser. No. 26,402, Apr. 2, 1979, Pat. No. 4,243,658, which is a continuation-in-part of Ser. No. 865,681, Dec. 29, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 424,578

Int. Cl.³ A61K *7/18*

U.S. Cl. 424—52 **2 Claims**

2. A method of substantially reducing elution of a therapeutic agent previously applied to teeth which comprises the steps of

applying said therapeutic agent to teeth, and

applying a dentifrice composition to said treated teeth, wherein said dentifrice composition comprises (1) at least one ingredient selected from the group consisting of therapeutic agents, polishing agents, surfactants, flavoring agents, sweetening agents, thickening agents and humectants and (2) at least 0.05% by weight of a cationic, polymeric, water-dispersible, membrane-forming material which, when applied to the surface of the teeth in an oral environment, forms a substantially continuous hydrophobic barrier thereon which substantially reduces the elution of said previously applied therapeutic agent from said teeth, and which is selected from the group polydimeryl polyamine, polyethylene imine, 1,5-dimethyldiazaundecamethylene polymethobromine hexadimethrine bromide, poly(N,N-dimethyl-3,5-dimethylenepiperidinum chloride), and simple proteins which, upon cleavage by enzyme or acid, yield only amino acids.

4,428,931

BACTERIAL TOXOIDS AND GRAM-NEGATIVE IMMUNE GLOBULIN THEREFROM

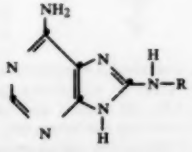
Richard L. Tolman, Warren; Stephen Marburg, Metuchen, both of N.J., and Lynn T. Callahan, III, North Wales, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1982, Ser. No. 358,133

Int. Cl.³ A61K *39/05, 39/108*; C07C *103/52*

U.S. Cl. 424—87 **5 Claims**

1. Toxoids which are



or

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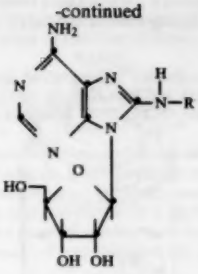


wherein R is the ADP-ribosylating toxin radical exotoxin-A from *P. aeruginosa* heat labile enterotoxin from *E. coli*, cholera enterotoxin from *V. cholerae*, or diphtheria exotoxin from *C. diphtheriae*.

4. A composition comprising an antitoxin effective amount of the toxoid of claim 1, antiseria raised against said toxoid, gammaglobulin or other antibody-containing fractions of said antisera, and a pharmaceutically acceptable carrier.

4,428,932

PHARMACEUTICAL COMPOSITIONS

Brain G. Overell, North Holmwood, England, assignor to Beecham Group Limited, England

Filed Apr. 29, 1982, Ser. No. 373,290

Claims priority, application United Kingdom, Apr. 29, 1981, 8113209

Int. Cl.³ A61K *39/36*

U.S. Cl. 424—91 **8 Claims**

1. A pharmaceutical composition comprising a desensitizing effective amount of a non-infective allergen and an adjuvant effective amount of C_{10-22} alkyl ester of tyrosine or a pharmaceutically acceptable salt thereof.

4,428,933

COMPOSITION FOR TREATING ACNE, METHOD OF MANUFACTURING SAID COMPOSITION, AND METHOD OF TREATING SKIN

John R. King, 8414 Greenham Dr., San Antonio, Tex. 78239

Filed Aug. 2, 1982, Ser. No. 404,545

Int. Cl.³ A61K *31/075, 31/315, 37/00*

U.S. Cl. 424—93 **14 Claims**

1. A composition for treating acne comprising: between about 75% wt and 95% wt of pulverized oats, between about 3.5% wt and 5.5% wt of sulfur, between about 0.001% wt and 0.015% wt of zinc gluconate, between about 0.5% wt and 2.5% wt of mustard seed, between about 2.0% wt and 4.0% wt of boric acid, between about 0.001% wt and 0.009% wt of yeast, between about 0.05% wt and 0.15% wt of a peroxide compound, between about 0.05% wt and 0.15% wt of alcohol, between about 1.5% wt and 3.5% wt of an additional fluid, and between about 0.05% wt and 0.15% wt of egg yolks.

4,428,934

METHOD FOR OXYGENATING BLOOD

Donald A. Raible, Santa Ana, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

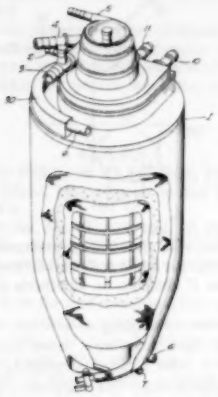
Division of Ser. No. 823,149, Aug. 9, 1977, Pat. No. 4,282,180, which is a continuation-in-part of Ser. No. 689,971, May 26, 1976, Pat. No. 4,268,476, which is a continuation-in-part of Ser. No. 584,464, Jun. 6, 1975, abandoned. This application Jul. 29, 1981, Ser. No. 288,118

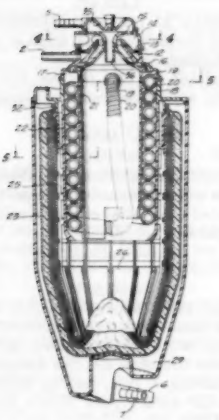
Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 **20 Claims**

1. A method of oxygenating blood comprising the steps of:

injecting oxygen-rich gas into liquid blood to form a blood-gas mixture having bubbles therein;





causing said mixture to follow a generally downward path from the point of mixing until oxygenation has been substantially completed; and

defoaming said mixture to remove bubbles therefrom.

4,428,935

PENICILLANIC ACID DIOXIDE PRODRUG

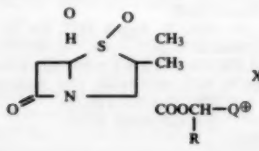
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 24, 1982, Ser. No. 381,104

Int. Cl.[3] **C07D** *499/00, 499/32;* **A61K** *31/425*

U.S. Cl. 424—114 **13 Claims**

1. A compound of the formula



wherein:

R is hydrogen;

Q is chosen so that the compound hydrolyzes in vivo to 4.4-dioxopenicillanic and is selected from the group consisting of

$N(R_1)(R_2)(R_3)$ wherein R_1, R_2 and R_3 are each alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms, alkoxycarbonylalkyl wherein the alkyl has 1–4 carbon atoms and the alkoxy has 1–4 carbon atoms or aminocarbonylalkyl wherein the alkyl has 1–4 carbon atoms,

N-alkyl-morpholyl wherein the alkyl has 1–4 carbon atoms, N-alkyl-piperidyl wherein the alkyl has 1–4 carbon atoms or N-alkyl-pyrrolidyl wherein the alkyl has 1–4 carbon atom, and those groups substituted at a ring position with alkyl having 1–4 carbon atoms, aminocarbonyl, hydroxyl or alkoxycarbonyl wherein the alkoxy has 1–4 carbon atoms,

bicyclo [2.2.2]1-,4-diazaoctanyl and those substituted with alkyl having 1–4 carbon atoms, aminocarbonyl, hydroxyl or alkoxycarbonyl wherein the alkoxy has 1–4 carbon atoms,

pyridyl, alkylpyridyl wherein the alkyl has 1–4 carbon atoms, dialkylpyridyl wherein each alkyl has 1–4 carbon atoms, trialkylpyridyl wherein each alkyl has 1–4 carbon atoms, halopyridyl, cyanopyridyl, nitropyridyl, aminocarbonylpyridyl, N-alkylaminocarbonylpyridyl wherein the alkyl has 1–4 carbon atoms, N,N-dialkylaminocarbonylpyridyl wherein each alkyl has 1–4 carbon atoms, alkoxycarbonylpyridyl wherein the alkoxy contains 1–4 carbon atoms, or N,N-dialkylaminopyridyl wherein each alkyl has 1–4 carbon atoms, and

quinolyl or N-alkylimidazolyl wherein the alkyl has 1–4 carbon atoms; and

X^- is a pharmaceutically-acceptable anion.

4,428,936

ANTIBACTERIAL COMPOSITION FOR MEDICAL USE

Isamu Saikawa; Takashi Yasuda; Masaru Tai; Yutaka Takashita, all of Toyama; Hiroshi Sakai, Takaoka; Michiko Mae, Toyama; Masahiro Takahata, Kosugimachi, and Susumu Mitsuhashi, Musashino, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

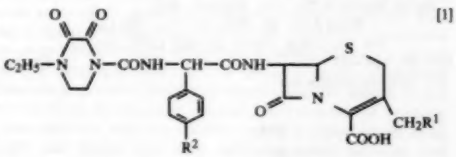
Continuation of Ser. No. 22,102, Feb. 20, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,755

Claims priority, application Japan, Mar. 24, 1978, 53-33043

Int. Cl.[3] **A61K** *35/00*

U.S. Cl. 424—114 **1 Claim**

1. An antibacterial composition for medical use comprising as active ingredients (A) a cephalosporin represented by the formula:



[1]

wherein R^1 is 5-(1-methyl-1,2,3,4-tetrazolyl)thio and R^2 represents a hydrogen atom or a hydroxy group or a pharmaceutically acceptable salt thereof and (B) a β-lactamase-inhibiting compound having a β-lactam ring selected from the group consisting of Methicillin and pharmaceutically acceptable salts thereof, and the ratio of ingredient (B) to ingredient (A) is from 0.1:1 to 2.0:1.

4,428,937

ANTIBACTERIAL AGENTS

Thomas T. Howarth, Ewhurst, England, assignor to Beecham Group Limited, England

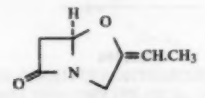
Division of Ser. No. 87,030, Oct. 22, 1979, Pat. No. 4,297,345, which is a division of Ser. No. 857,112, Dec. 5, 1977, Pat. No. 4,232,005, which is a division of Ser. No. 669,697, Mar. 23, 1976, Pat. No. 4,098,897. This application Dec. 15, 1980, Ser. No. 216,075

Claims priority, application United Kingdom, Apr. 14, 1975, 15209/75; Sep. 27, 1975, 39663/75

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 20 Claims

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a pharmaceutically acceptable ester of a compound of the formula VIII:



(VIII)

wherein R is methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, vinyl, allyl, butenyl, cyclopropyl cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclohexenyl, cyclohexadienyl, methylcyclopentyl, methylcyclohexyl, cyclopentylmethyl, cyclohexylmethyl, benzyl, benzhydryl, phenylethyl, naphthyl methyl, naphthyl, phenyl, propynyl, tolyl, 2-chloroethyl, 2,2,2-trichloroethyl, 2,2,2-trifluroethyl, acetylmethyl, benzoylmethyl, 2-methoxyethyl, p-chlorobenzyl, p-methoxybenzyl, p-nitrobenzyl, p-bromobenzyl, m-chlorobenzyl, 6-methoxynaphthyl-2-methyl, p-chlorophenyl, p-methoxyphenyl or β-2′-pyridylethyl and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,428,938

PEPTIDES AFFECTING THE IMMUNE REGULATION AND A PROCESS FOR THEIR PREPARATION

Lajos Kisfaludy; Olga Nyeki nee Kuprina; Istvan Schon; Laszlo Denes; Julia Ember; György Hajos; Laszlo Szporny, and Bela Szende, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jun. 11, 1982, Ser. No. 387,655

Claims priority, application Hungary, Jun. 12, 1981, 1755/81

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 3 Claims

1. Peptides affecting the immune regulation selected from the following group:

Arg-Lys-Asp
Arg-Lys-Asp-Val
Arg-Lys-Asn-Val
Arg-Lys-Asu-Val
Arg-Lys-Ala-Val
Arg-Lys-Asp-Ala
Arg-Lys-Asp-Ile
Arg-Lys-Glu-Val
Arg-Ala-Asp-Val
Arg-Asp-Lys-Val
Ala-Lys-Asp-Val
Lys-Arg-Asp-Val
Glp-Arg-Lys-Asp
Glp-Arg-Lys-Asp-Val
Glp-Arg-Lys-Asp-Val-Tyr

and salts, amides, lower alkyl esters and protected derivatives thereof.

4,428,939

COLLAGEN INHIBITING COMPOSITIONS AND PROCESSES FOR MANUFACTURING AND USING SAME

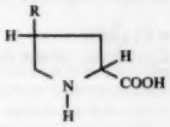
Darwin J. Prockop, 38 Turner Ct., Princeton, N.J. 08540

Filed Oct. 16, 1981, Ser. No. 311,920

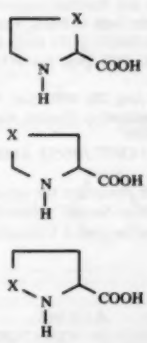
Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 4 Claims

1. A composition for the control of the cellular synthesis of collagen fibers in animals, which comprises a proline analog in polymeric form selected from the group, consisting of L-azetidine-2-carboxylic acid; cis-4-hydroxy-L-proline; 3,4-dehydro-L-proline; cis-4-hydroxy-L-proline; cis-4-chloro-L-proline; laevo and cis isomers of compounds of the general structural formula



wherein R is OH, Cl, F, NH_2, CH_3, $OC(O)CH_3$, $OC(O)CH_2CH_3$, SH, SCH_3, OCH_3, ONO_2, OSO_3H, H_2PO_4, or COOH; L-pipecolic acid; 1,2,3,6-tetrahydro-L-picolinic acid; 1,2,3,4-tetrahydro-L-picolinic acid; 1,4,5,6-tetrahydro-L-picolinic acid; 1,2,5,6-tetrahydro-L-picolinic acid; 1,2-dihydro-L-picolinic acid; laevo isomers of the compound of the general structural formula



where X is N, S or O; or mixture thereof and a pharmaceutically acceptable carrier therefor.

4,428,940

ANTI-HYPERTENSIVE COMPOUNDS AND COMPOSITIONS

Roger E. Markwell, Great Dunmow, England, assignor to Beecham Group p.l.c., England

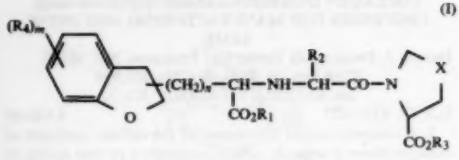
Filed Mar. 9, 1982, Ser. No. 356,445

Claims priority, application United Kingdom, Mar. 12, 1981, 8107837

Int. Cl.³ A61K *37/00*; A01N *43/78*

U.S. Cl. 424—177 13 Claims

1. A compound of formula (I),



(I)

or a pharmaceutically acceptable salt thereof, wherein:

m is 0 to 3;

n is 1 to 5;

R_1 is hydrogen or C_{1-6} alkyl;

R_2 is hydrogen, C_{1-4} alkyl, $-(CH_2)_p-NH_2$ wherein p is 1 to 4, or $-NHCOR_5$ wherein R_5 is C_{1-4} alkyl;

R_3 is hydrogen or C_{1-6} alkyl

R_4 is C_{1-4} alkyl, C_{1-4} alkoxy, halogen or CF_3;

and x is CH_2 or S.

4,428,941

NUCLEOTIDIC SEQUENCE CODING THE SURFACE ANTIGEN OF THE HEPATITIS B VIRUS, VECTOR CONTAINING SAID NUCLEOTIDIC SEQUENCE, PROCESS ALLOWING THE OBTENTION THEREOF AND ANTIGEN OBTAINED THEREBY

Francis Galibert, Saint-Gratien; Pierre Tiollais, Paris, and Patrick Charnay, Boulogne-Billancourt, all of France, assignors to Institut Pasteur and Institut National de la Sante et de la Recherche Medicale, both of Paris, France

PCT No. PCT/FR80/00133, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 29, 1981, PCT Pub. No. WO81/00577, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 29, 1980, Ser. No. 261,199

Claims priority, application France, Aug. 3, 1979, 79 21811; Apr. 22, 1980, 80 09039

Int. Cl.³ C07C *103/52;* A61K *37/02*

U.S. Cl. 424—177 **10 Claims**

1. A peptide which comprises the sequence: Alanine-Glutamine-Glycine-Threonine-Serine, wherein the alanine end is N-terminal and the serine end is C-terminal.

4,428,942

ANALOGS OF SOMATOSTATIN

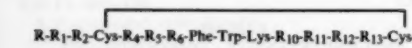
Jean E. F. Rivier; Wylie W. Vale, Jr., both of La Jolla, and Marvin R. Brown, Del Mar, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed May 17, 1982, Ser. No. 378,748

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 **19 Claims**

1. A method for the treatment of mammals to increase electrolyte absorption in the gut comprising administering an effective amount of a somatostatin analog having the formula:



wherein: R is hydrogen; R_1 is Ala or des R_1; R_2 is Gly or des R_2; R_4 is Lys or D-Lys or des R_4; R_5 is Asn or des R_5; R_6 is Phe or D-Phe or Ala; R_{10} is Thr or Ala or des R_{10}; R_{11} is Ala, Arg, Trp, Val, Ile, Ser, Thr, Glu, His, β-Nal, Lys Pro or des R_{11}; R_{12} is Thr or Ala or des R_{12}; and R_{13} is Ser or D-Ser or des R_{13}; provided that not more than two of R_{10}, R_{11}, R_{12} and R_{13} are deleted and provided that if R_4 is deleted, either R_{12} or R_{13} is also deleted; or a nontoxic addition salt thereof.

4,428,943

(N-PHOSPHONACETYL-L-ASPARTATO) (1,2-DIAMINOCYCLOHEXANE)PLATINUM(II) OR ALKALI METAL SALT

Sandra J. Meischen; Glen R. Gale, both of Charleston, S.C., and Marion B. Naff, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 155,531, Jun. 9, 1980, Pat. No. 4,284,579, which is a continuation-in-part of Ser. No. 58,287, Jul. 17, 1979, abandoned. This application Jul. 15, 1981, Ser. No. 283,376

Int. Cl.³ A61K *31/66, 31/28*

U.S. Cl. 424—211 **3 Claims**

1. A method of treating L1210 leukemia in mice which comprises administering intraperitoneally 5–60 mg/kg of body weight using (N-phosphonacetyl-L-aspartato)(1,2-diaminocyclohexane)platinum(II) or alkali metal salt thereof.

4,428,944

TRIFLUOROMETHOXYPHENYL-(di) THIOPHOSPHORIC ACID ESTERS AND THEIR USE IN PEST CONTROL

Walter Seufert, Ludwigshafen; Karl Kiehs, Lampertheim; Gerd Husslein, Bad Durkheim; Juergen Varwig, Heidelberg; Gerhard Hamprecht, Weinheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

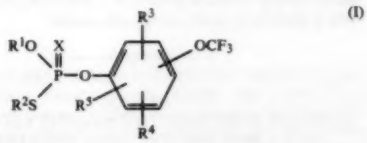
Filed Dec. 9, 1981, Ser. No. 329,122

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047242

Int. Cl.³ A01N *57/14;* C07F *9/16*

U.S. Cl. 424—217 **7 Claims**

1. A trifluoromethoxyphenyl-(di)thiophosphoric acid ester of the formula



(I)

where R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl of 1 to 5 carbon atoms or alkoxyalkyl of 2 to 6 carbon atoms, R^3, R^4 and R^5 independently of one another are each hydrogen or halogen, and X is oxygen or sulfur.

7. A process for combating pests, wherein an effective amount of a trifluoromethoxyphenyl-(di)thiophosphoric acid ester of the formula I as defined in claim 1 is allowed to act on the pests and/or their habitat.

4,428,945

O-ALKYL S-(TERTIARY ALKYL) ALKYLPHOSPHONOTHIOATE INSECTICIDES AND NEMATOCIDES

Mohamed A. Fahmy, Princeton, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

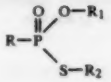
Continuation of Ser. No. 209,093, Nov. 21, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,356

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ A01N *57/20;* C07F *9/40*

U.S. Cl. 424—222 **40 Claims**

1. A method for controlling insects and nematodes which comprises applying thereto or to their habitat a pesticidal amount of a compound of the formula



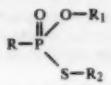
in which

R is an alkyl of 1 to 8 carbon atoms, haloalkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, haloalkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, or haloalkynyl of 2 to 8 carbon atoms;

R_1 is an alkyl of 1 to 8 carbon atoms; and

R_2 is a tertiary alkyl of 4 to 8 carbon atoms.

15. A compound of the formula



in which

R is an alkyl of 1 to 8 carbon atoms, haloalkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, haloalkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, or haloalkynyl of 2 to 8 carbon atoms;

R_1 is an alkyl of 1 to 8 carbon atoms; and

R_2 is tertiary alkyl of 4 to 8 carbon atoms.

4,428,946

METHOD OF PREVENTING MILK FEVER IN DAIRY CATTLE

Hector F. DeLuca; Heinrich K. Schnoes, both of Madison, and Neal A. Jorgensen, Middleton, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 26, 1982, Ser. No. 401,996

Int. Cl.³ A01N *45/00*

U.S. Cl. 424—236 **16 Claims**

1. The method for treatment and prophylaxis for milk fever disease in dairy cattle which comprises administering to said cattle prior to parturition a vitamin D derivative, which is characterized by the presence of a hydroxyl group at at least one of the C-1 and C-25 positions and a halogen substituent at the C-24 position in the molecule, in an amount sufficient to induce said treatment and prophylaxis.

4,428,947

ESTERS OF 17 α-ETHYNYL 19-NOR-TESTOSTERONE AND 17 α-ETHYNYL-18 HOMO-19-NOR-TESTOSTERONE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Sydney Archer, Troy, N.Y.; Pierre Crabbe, Columbia, Mo.; Egon Diczfalusy, Stockholm, Sweden; Carl Djerassi, Stanford, Calif., and Josef Fried, Chicago, Ill., assignors to World Health Organization, Geneva, Switzerland

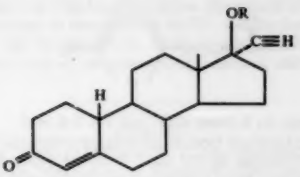
Filed Apr. 7, 1981, Ser. No. 251,914

Int. Cl.³ A61K *31/56*

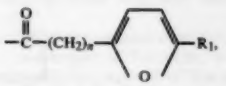
U.S. Cl. 424—243 **21 Claims**

1. A steroid ester selected from the group consisting of

(a) an ester of D-17α-ethynyl-19-nortestosterone having the formula



wherein R is selected from the group consisting of



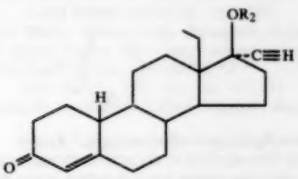
(I)

wherein R_1 is lower alkyl and n is 1–6, and

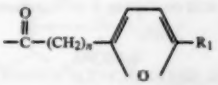
(2) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–8 carbon atoms in the ring, said ring being substituted by alkyl having 1–8 carbon atoms;

(b) the corresponding oxime of the ester defined in (a);

(c) an ester of levo-norgestrel having the formula



wherein R_2 is selected from the group consisting of (i)



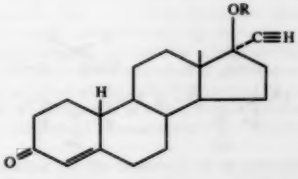
wherein R_1 is lower alkyl and n is 1–6, and (ii) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–6 carbon atoms in the ring;

(d) the corresponding oxime of the ester defined in (c); and

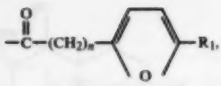
(e) the oxime of an ester of levo-norgestrel having the formula in (c) wherein R_2 is acyl derived from an aliphatic carboxylic acid containing 4 or 5 carbon atoms.

18. A pharmaceutical composition for suppressing fertility comprising a fertility suppressing amount of a steroid ester in combination with a pharmaceutically acceptable carrier, said steroid ester being selected from the group consisting of

(a) an ester of D-17-α-ethynyl-19-nortestosterone having the formula



wherein R is selected from the group consisting of



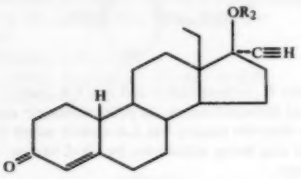
(I)

wherein R_1 is lower alkyl and n is 1–6, and

(2) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–8 carbon atoms in the ring, said ring being substituted by alkyl having 1–8 carbon atoms;

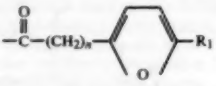
(b) the corresponding oxime of the ester defined in (a);

(c) an ester of levo-norgestrel having the formula



wherein R_2 is selected from the group consisting of

(i)



wherein R_1 is lower alkyl and n is 1–6, and

(ii) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–6 carbon atoms in the ring;

(d) the corresponding oxime of the ester defined in (c); and

(e) the oxime of an ester of levo-norgestrel having the formula in (c) wherein R_2 is acyl derived from an aliphatic carboxylic acid containing 4 or 5 carbon atoms.

4,428,948

NOVEL HETEROCYCLIC COMPOUNDS

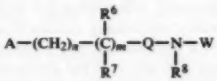
George A. Miller, Maple Glen, and Lendon N. Pridgen, Lansdale, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 3, 1977, Ser. No. 765,146

Int. Cl.[3] A01N *43/48, 43/72;* C07D *233/22, 245/02*

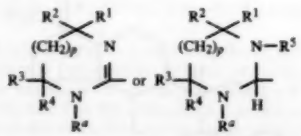
U.S. Cl. 424—244 14 Claims

1. A compound of the formula



wherein

A is a group of the formula



wherein

R^1, R^2, R^3 and R^4 are independently

hydrogen;

$(C_1–C_3)$ alkyl optionally substituted with up to three halogens or $(C_1–C_3)$ alkoxy;

$(C_2–C_4)$ alkenyl;

$(C_2–C_4)$ alkynyl;

$(C_1–C_4)$ alkoxy;

$(C_1–C_4)$ alkylthio;

R^a is hydrogen, $(C_1–C_8)$ alkyl, phenyl, benzyl, p-toluenesulfonyl or methylsulfonyl;

p is zero or an integer from one to three; and

R^5 is $(C_1–C_3)$ alkyl;

R^6 and R^7 are independently

hydrogen;

$(C_1–C_3)$ alkyl;

$(C_2–C_4)$ alkenyl;

$(C_2–C_4)$ alkynyl; or

phenyl optionally substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, $(C_1–C_4)$ alkoxy, and $(C_1–C_4)$ alkyl; or

R^6 and R^7 can be taken together to form a $(C_5–C_8)$ cycloalkyl group;

R^8 is hydrogen or $(C_1–C_3)$ alkyl;

Q is the group

wherein

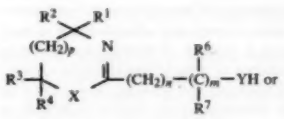
Y is O, S or NH and Z is O or S;

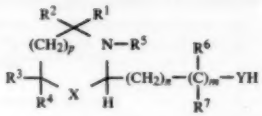
W is phenyl optionally substituted with up to four halogen substituents or optionally substituted with up to two substituents independently selected from the group consisting of halogen, nitro, trihalomethyl, $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, $(C_1–C_4)$ alkylthio, $(C_1–C_4)$ alkylsulfinyl, $(C_1–C_4)$ alkylsulfonyl, di $(C_1–C_2)$ alkylamino, $(C_1–C_4)$ alkylcarbonyl and phenylcarbonyl;

n is zero or an integer from one to five;

m is zero or the integer one; and the stabile agronomically acceptable acid addition salts, alkyl halide salts, alkali metal and alkaline earth salts, metal salt complexes, enantiomorphs and racemic mixtures thereof.

8. A compound of the formula





wherein

R^1, R^2, R^3 and R^4 are independently

hydrogen;

$(C_1–C_3)$ alkyl optionally substituted with up to three halogens or $(C_1–C_3)$ alkoxy;

$(C_2–C_4)$ alkenyl;

$(C_2–C_4)$ alkynyl;

$(C_1–C_4)$ alkoxy;

$(C_1–C_4)$ alkylthio;

X is S when Y is O; and

X is NR^a or S when Y is S, wherein R^a is hydrogen, $(C_1–C_8)$alkyl, phenyl, benzyl, p-toluenesulfonyl or methylsulfonyl;

Y is O or S;

p is zero to three;

R^5 is (C_1–C_3) alkyl;
R^6 and R^7 are independently
hydrogen;
(C_1–C_3) alkyl;
(C_2–C_4) alkenyl;
phenyl optionally substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, (C_1–C_4) alkoxy, and (C_1–C_4) alkyl; or
R^6 and R^7 can be taken together to form a (C_5–C_8) cycloalkyl group;
n is zero to five; and
m is zero or one.

4,428,949

COMBATING FUNGI WITH FLUORINATED 1-AZOLYLBUTANE DERIVATIVES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

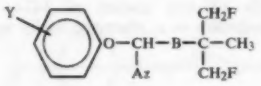
Filed Aug. 25, 1981, Ser. No. 295,982

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033592

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *233/60, 249/08*

U.S. Cl. 424—245 **10 Claims**

1. A 4-fluoro-1-azolyl-1-phenoxy-butan-2-one- or -ol of the formula



in which
Az is an imidazol-1-yl or 1,2,4-triazol-1-yl radical,
B is a keto or CH(OH) group, and
Y is a methoxy or trifluoromethyl radical,
or an addition product thereof with a physiologically acceptable acid or a metal salt.

8. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim **1** in admixture with a diluent.

4,428,950

(HETARYLPHENOXY)-(PHENYLPIPERAZINYL)-PROPANOLS, THEIR PREPARATION AND DRUGS CONTAINING THESE COMPOUNDS

Albrecht Franke, Wachenheim; Gerd Steiner, Kirchheim; Peter C. Thieme, Wachenheim; Dieter Lenke, Ludwigshafen; Josef Gries, Wachenheim, and Hans-Juergen Teschendorf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

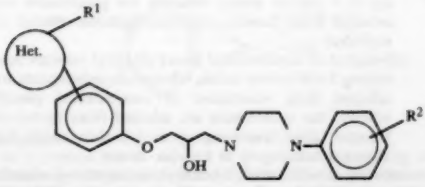
Filed Jan. 15, 1982, Ser. No. 339,508

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101456

Int. Cl.[3] **C07D** *403/00;* **A61K** *31/495*

U.S. Cl. 424—250 **7 Claims**

1. A compound of the general formula I



I

where R^1 is hydrogen, amino or alkyl of 1 to 4 carbon atoms, R^2 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms or alkoxy where alkyl is of 1 to 3 carbon atoms, the phenyl ring can be monosubstituted or disubstituted by R^2, and the heterocyclic structure Het. is triazol-1-yl, imidazol-1-yl, pyrazol-3-yl or isoxazol-3-yl, and its physiologically tolerated addition salts with acids.

4,428,951

LONG ACTING PHARMACEUTICAL COMPOSITION

Takehisa Hata, Muko; Kenichi Nishimura, Takatsuki, and Mitsuru Yasumura, Nishinomiya, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 22, 1982, Ser. No. 370,668

Int. Cl.[3] **A61K** *9/22, 9/52, 31/495*

U.S. Cl. 424—250 **4 Claims**

1. A long-acting pharmaceutical composition in tablet form for the oral administration of Tiaramide, which comprises: a pharmaceutically effective amount of Tiaramide or pharmaceutically acceptable salt thereof as an active ingredient dissolved in a water-insoluble solid vehicle selected from the group consisting of carnabua wax, hydrogenated oil and a paraffin.

4,428,952

SUBSTITUTED PYRROLO[2,1-b]QUINAZOLINES AND PYRIDO[2,1-b]QUINAZOLINES USEFUL FOR THE TREATMENT OF OR THE PREVENTION OF GASTROINTESTINAL ULCERS

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Giuliana Arcari, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

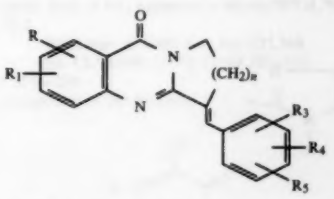
Filed Jun. 10, 1982, Ser. No. 387,181

Claims priority, application United Kingdom, Jun. 30, 1981, 8120126

Int. Cl.[3] **A61K** *31/505;* **C07D** *471/04*

U.S. Cl. 424—251 **14 Claims**

1. A compound of general formula (I)



(I)

wherein
n is 1 or 2;
R is hydrogen; and R_1 is a carboxy group or a group —$COOR_6$, wherein R_6 represents a C_1–C_6 alkyl group which may be unsubstituted or substituted by C_1–C_4 dialkylamino group; R_2 represents a hydrogen atom or a C_1–C_4 alkyl group; each of R_3, R_4 and R_5 independently represents a hydrogen or a halogen atom, a hydroxy group, formyloxy, a C_2–C_8 alkanoyloxy group, a —CF_3 group, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a C_3–C_4 alkenyloxy group or adjacent groups represented by two of R_3, R_4 and R_5, taken together, form a C_1–C_3 alkylenedioxy group; and the pharmaceutically acceptable salts thereof.

13. A pharmaceutical composition suitable for the treatment of or the prevention of the formation of gastrointestinal ulcers, comprising a therapeutically effective amount of a compound of formula (I) as claimed in claim **1**, or a pharmaceutically acceptable salt thereof, in association with a suitable carrier or diluent.

14. A method for the treatment of or prevention of the formation of gastrointestinal ulcers in a patient in need of such treatment, said method comprising administering to said pa-

tient a therapeutically effective amount of a compound of the formula (I) as claimed in claim 1, or a pharmaceutically acceptable salt thereof.

4,428,953

PLEUROMUTILIN DERIVATIVES, THEIR PRODUCTION AND USE

Heinz Berner, Vienna; Friederike Turnowsky, Maria Enzersdorf; Georg Laber, Vienna, and Johannes Hildebrandt, Oeynhausen, all of Austria, assignors to Sandoz, Ltd., Basel, Switzerland

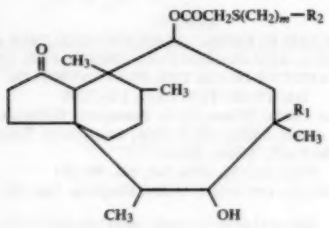
Continuation of Ser. No. 198,292, Oct. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 111,446, Jan. 11, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,043

Claims priority, application Switzerland, Jan. 12, 1979, 309/79; Aug. 8, 1979, 7274/79

Int. Cl.³ A01N *43/64;* **C07D** *249/12, 249/14, 401/04*

U.S. Cl. 424—263 **18 Claims**

1. A compound of the formula



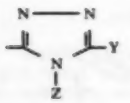
I

in which

R_1 is ethyl or vinyl,

m is 0 or 1, and

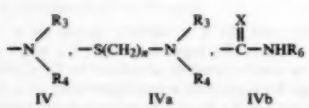
R_2 is



V

in which

Z is hydrogen, lower alkylsulphonyl, amino, formyl,



IV IVa IVb

in which

either R_3 and R_4 are the same or different and each is hydrogen, lower hydroxyalkyl, lower dihydroxyalkyl, unsubstituted or lower alkoxysulphonyl substituted lower alkanoyl, lower alkyl sulphonyl or lower alkyl,

or R_3 and R_4 together with the nitrogen atom form a piperazinyl radical, which may be substituted on the second nitrogen atom by lower alkyl, lower hydroxyalkyl or lower dihydroxyalkyl,

n is 2 to 5,

X is oxygen or sulphur, and

R_6 is lower alkyl or lower alkoxycarbonyl, and

Y is hydrogen, amino, trifluoromethyl, lower alkyl, pyridyl or

where R_3 and R_4 are as defined above, or a chemotherapeutically acceptable acid addition or quaternary ammonium salt thereof.

17. A method of treating microbial infections comprising administering to a subject in need of such treatment, a chemotherapeutically effective amount of a compound of claim 1.

4,428,954

METHOD FOR TREATMENT OF CEREBROVASCULAR DISORDERS

John F. Cavalla, Isleworth, and Michael G. Wyllie, Maidenhead, both of England, assignors to John Wyeth and Brother Limited, Maidenhead, England

Continuation of Ser. No. 250,963, Apr. 1, 1981, abandoned. This application May 10, 1982, Ser. No. 376,477

Claims priority, application United Kingdom, Nov. 1, 1980, 803203

Int. Cl.³ A61U *31/44*

U.S. Cl. 424—263 **2 Claims**

1. A method for the treatment of cerebrovascular disorders characterised by poor oxygenation in an animal afflicted with such a disorder which comprises administering to said animal a therapeutically effective amount of 3-[2-(4-benzamido-1-piperidyl)ethyl]indole or a pharmaceutically acceptable salt thereof.

4,428,955

BENZOPYRAN COMPOUNDS, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND METHODS OF USE

Walter-Gunar Friebe, Darmstadt; Wolfgang Kampe, Heddesheim; Egon Röesch, Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

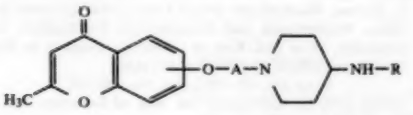
Filed Apr. 27, 1982, Ser. No. 372,415

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117389

Int. Cl.³ A61K *31/445;* **C07D** *405/12, 405/14*

U.S. Cl. 424—267 **17 Claims**

1. Benzopyranyl ether compound of the formula



wherein

A is alkylene or 2 to 4 carbons; and

R is hydrogen or acyl selected from the group consisting of

substituted or unsubstituted alkanoyl radicals containing up to 5 carbon atoms, wherein the substituents are selected from fluorine, chlorine, bromine, phenyl or naphthyl;

substituted or unsubstituted lower alkenoyl radicals containing 3 to 6 carbon atoms, wherein the substituents are selected from substituted or unsubstituted phenyl wherein the substituents are selected from hydroxyl, halogen, alkyl containing up to 6 carbon atoms and alkoxy containing up to 6 carbon atoms

unsubstituted or substituted benzoyl, or naphthoyl wherein the substituents are fluorine, chlorine, bromine, hydroxyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, lower

alkanoyloxy, carboxyl, nitro, amino, lower alkanoylamino, nitrile, trifluoromethyl, carbamoyl, lower alkylthio, lower alkylsulphinyl, lower alkylsulphonyl, lower alkanoyl, benzoyl, hydroxy lower alkyl or lower alkoxy lower alkyl;

furancarbonyl, thiophenecarbonyl, pyridinecarbonyl, tetrahydrofuran-carbonyl, tetrahydrothiophene-carbonyl or C_3–C_7 cycloalkylcarbonyl; or

benzene-sulphonyl or methane sulphonyl,

and salts thereof with pharmacologically acceptable acids.

11. Pharmaceutical composition for the treatment of allergic diseases comprising a pharmaceutical acceptable carrier and, in an amount effective to treat allergic diseases, at least one benzopyranyl ether compound as claimed in claim **1**.

4,428,956

4-HYDROXY-5-SUBSTITUTED-3-(2H)-ISOTHIAZOLONE-1,1-DIOXIDE DERIVATIVES USEFUL IN TREATING URINARY TRACT CALCIUM OXALATE LITHIASIS

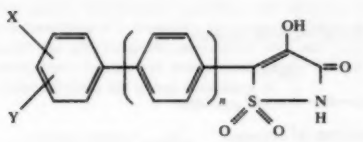
Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc. and Merck Sharp & Dohme (I.A.) Corp., both of Rahway, N.J.

Filed Dec. 29, 1980, Ser. No. 221,173

Int. Cl.³ C07D *275/02;* **A61K** *31/44*

U.S. Cl. 424—270 **13 Claims**

1. A compound of the formula:



(I.)

where

X and Y are independently selected from the group consisting of hydrogen, halogen, and C_{1-6} alkyl; provided that positions 2 and 6 of the substituted phenyl moiety may not be substituted; and n is 0 or 1;

or a pharmaceutically acceptable salt thereof.

4,428,957

6-ISOTHIOCYANO-5-METHOXY-2-TERT.-BUTYLBENZTHIAZOLE AND A METHOD OF CONTROLLING RUMINANT LIVER FLUKES THEREWITH

Joseph C. Boray, Neutral Bay, Australia; Jean J. Gallay, Blumenrain, and Gedeon Sarasin, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

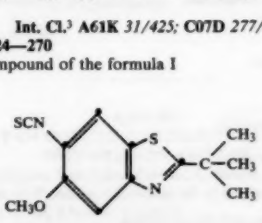
Continuation-in-part of Ser. No. 59,087, Jul. 19, 1979, abandoned. This application May 4, 1981, Ser. No. 260,651

Claims priority, application Switzerland, Jul. 27, 1978, 8082/78

Int. Cl.³ A61K *31/425;* **C07D** *277/64*

U.S. Cl. 424—270 **6 Claims**

1. A compound of the formula I



(I)

and pharmaceutically acceptable salts thereof.

5. A method for the control of liver flukes comprising administering to ruminants infested therewith an anthelmintically effective amount of the compound of the formula I according to claim **1**.

4,428,958

THERAPEUTIC COMPOUNDS CONTAINING β-LACTAMS

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, England

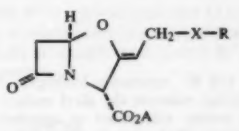
Filed Jan. 24, 1977, Ser. No. 761,712

Claims priority, application United Kingdom, Jan. 31, 1976, 03892/76; May 8, 1976, 19002/76

Int. Cl.³ C07D *498/04*

U.S. Cl. 424—272 **100 Claims**

1. A compound of the formula (II):



(II)

wherein X is S, SO or SO_2, R is an inert hydrocarbon of up to 20 carbon atoms unsubstituted or substituted by halogen, by a member selected from the group consisting of OR^1, $O.COR^1$, $CO.R^1$, CO_2R^1, NHR^1, NR^1R^2, $NH.CO.R^1$, NR^2CO^1, $NHCO_2R^1$ and $NR^2CO_2R^1$ wherein R^1 is hydrogen or a hydrocarbon of up to 8 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, or by halogen and a member of said group which will not lead to rapid degradation of the compound of the formula (II), or R is a heteroaromatic ring of 5 or 6 ring members unsubstituted or substituted by alkyl of up to 3 carbon atoms or by alkyl of up to 3 carbon atoms substituted by $CONH_2$ or CO_2H and A is a group such that CO_2A represents a carboxylic acid group or a non-toxic salt or non-toxic ester thereof.

4,428,959

4-ALKYLSUBSTITUTED-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

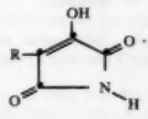
Edward J. Cragoe, Jr., Lansdale, and Clarence S. Rooney, Worcester, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 4, 1980, Ser. No. 137,345

Int. Cl.³ A61K *31/40;* **C07D** *207/456*

U.S. Cl. 424—274 **8 Claims**

1. A compound of the formula:



wherein R is a straight or branched chain alkyl group having from 6 to 16 carbon atoms or pharmaceutically acceptable salts thereof.

7. A method of treating persons afflicted with calcium oxalate kidney or bladder stones or preventing the formation of calcium oxalate kidney or bladder stones which comprises administering to such a patient an effective amount of a compound of claim **1**.

4,428,960

3-AMINO-6-SUBSTITUTED THIO-1-AZABICYCLO(3.2.0)HEPT-6-EN-2-ONE-7-CARBOXYLIC ACIDS

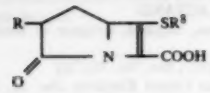
James V. Heck, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 19, 1982, Ser. No. 369,954

Int. Cl.³ C07D *205/12;* **A61K** *31/395*

U.S. Cl. 424—274 **4 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts and esters thereof, wherein R is NHR^1, R^1 is hydrogen, or acyl; wherein acyl is a radical of the formula:

wherein X is O or S and R'' represents hydrogen; amino; alkylamino or dialkylamino wherein the alkyl radical comprises 1 to 6 carbon atoms; substituted or unsubstituted; straight or branched chain alkyl wherein the alkyl radical comprises 1 to 6 carbon atoms; alkylthio comprising 1 to 6 carbon atoms; phenylthio comprising 6 to 10 carbon atoms; hydroxy; alkoxy comprising 1 to 6 carbon atoms; phenyloxy; alkenyl, or alkynyl groups comprising 2 to 6 carbon atoms; phenyl; benzyl; cycloalkyl comprising 3 to 6 carbon atoms; or a heteroaryl or heteroaralkyl group (mono- and bicyclic) wherein the alkyl moiety comprises 1 to 3 carbon atoms and the heterocyclic ring comprises 4–10 atoms consisting of 1–6 carbon atoms and 1–4 heteroatoms and the heteroatoms are selected from O, N and S; such above-listed groups can be unsubstituted or can be substituted by radicals such as OH, SH, SR^* (R^* is lower alkyl or phenyl), alkyl or alkoxy groups having 1 to 6 carbon atoms, chloro, bromo, fluoro, iodo, cyano, carboxy, sulfamino, carbamoyl, sulfonyl, azido, amino, alkylamino including quaternary ammonium wherein the alkyl group comprises 1 to 6 carbon atoms, trifluoromethyl, carboxyalkyl, carbamoylalkyl, N-carbamoylalkyl, wherein the alkyl moiety of the foregoing four radicals comprises 1 to 6 carbon atoms, amidino, guanidino, N-substituted guanidino, guanidino lower alkyl; or the acyl group is a radical of the formula:

wherein X is O or S and n is 0–4, Z represents oxygen, sulfur, carbonyl or nitrogen and R'' is defined as above; or the acyl group is a radical of the formula:

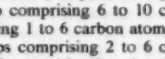
wherein R'' is defined as above and R''' is a radical selected from the group consisting of amino, hydroxy, azido, carbamoyl, guanidino, amidino, acyloxy, Cl, F, Br, I, sulfamino, tetrazolyl, sulfo, carboxy, carbalkoxy, and phosphono or if X is oxygen, the acyl group may also be a radical of the formula:

wherein R^3 represents hydrogen, chloro, fluoro, bromo, iodo, amino, guanidino, phosphono, hydroxy, tetrazolyl, carboxy, sulfo, or sulfamino and R^4 represents phenyl, substituted phenyl, a mono- or bicyclic heterocyclyl, substituted heterocycle, heterocyclic thio, or substituted heterocyclic thio containing one or more oxygen, sulfur or nitrogen atoms in the ring, phenylthio, phenyloxy, lower alkyl of 1–6 carbon atoms, or cyano, wherein the substituents on the moieties R^3 and R^4, can be halo, carboxymethyl, guanidino, guanidinomethyl, carboxamidomethyl, aminoethyl, nitro, methoxy or methyl; and R^8 is independently selected from the group consisting of hydrogen, substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; phenylalkyl, phenylalkenyl, and phenylalkynyl wherein the aliphatic portion has 1–6 carbon atoms; heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl, wherein the heteroatom or atoms are selected from 1–4 O, S, N and wherein the alkyl moieties associated with said heterocyclic moieties have 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radical R^8 are selected from the group consisting of:

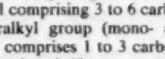
—X* halo (chloro, bromo, fluoro)

—OH hydroxy

—OR^1 alkoxy, phenyloxy

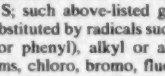


carbamoyloxy

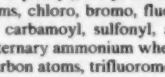


carbamoyl

—NR^1R^2 amino

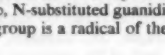


amidino



guanidino

—$SO_2NR^1R^2$ sulfamoyl



ureido

amido

—CO_2H carboxy

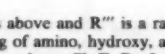
—OSO_3R^1 sulphate

—NO_2 nitro

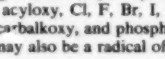
—$\overset{+}{N}(R^1)_3$ ammonium (R^1 groups independently chosen)

oximino

—CO_2R^1 carboxylate

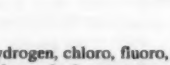


acyl

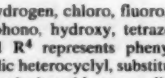


acyloxy

—SH mercapto



alkyl and phenyl sulfinyl



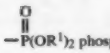
alkyl and phenyl sulfonyl

-continued

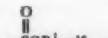
—CN cyano

—N_3 azido

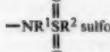
—SR^1 alkyl- and phenylthio



—$P(OR^1)_2$ phosphono

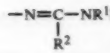


—SOR^1 sulfo and

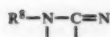


—NR^1SR^2 sulfonamido

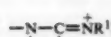
wherein, relative to the above listed substituents on R^6, R^7, and R^8, the groups R^1 and R^2 are independently selected from: hydrogen, alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl; phenylalkyl, phenylalkenyl, and phenylalkynyl wherein the aliphatic portion has 1–6 carbon atoms; heteroalkyl, heteroaralkyl, heterocyclyl and heterocyclylalkyl and wherein the heteroatom or atoms in the above-named heterocyclic moieties are selected from the group consisting of 1–4 oxygen, nitrogen or sulphur atoms and wherein the alkyl moieties associated with said heterocyclic moieties have 1–6 carbon atoms; additionally R^8 substituents are selected from the group consisting of



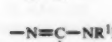
—N=C(—R^2)—NR^1R^2 amidino



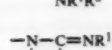
R^8—N(R^1)—C(R^2)=NR^1 amidino



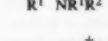
—N(R^1)—C(R^2)=$\overset{+}{N}R^1R^2$ amidinium



—N=C(—NR^1R^2)—NR^1R^2 guanidino



—N(R^1)—C(NR^1R^2)=NR^1 guanidino



—N(R^1)—C(NR^1R^2)=$\overset{+}{N}R^1R^2$ guanidinium.

4,428,961

β-LACTAM CONTAINING COMPOUNDS, THEIR PREPARATION AND USE

Robert Southgate, Warnham; Terence C. Smale, Epsom Downs, and Roger J. Ponsford, Horsham, all of England, assignors to Beecham Group Limited, England

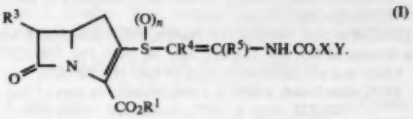
Filed Jan. 23, 1981, Ser. No. 227,765

Claims priority, application United Kingdom, Jan. 25, 1980, 8002565

Int. Cl.[3] **A61K** *31/40*; **D09D** *487/04*

U.S. Cl. 424—274 **66 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is a group such that CO_2R^1 is a carboxylic acid group, a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof; R^3 is hydrogen or a group of formula (c):

—$CR^6R^7R^8$ (c)

wherein R^6 is hydrogen, hydroxy, —OSO_3H or a pharmaceutically acceptable salt thereof, —OCOR* or —OCO_2R^* wherein R* is a hydrocarbon of 1 to 8 carbon atoms unsubstituted or substituted with halogen, alkoxy of 1 to 6 carbon atoms or nitro; R^7 is hydrogen or alkyl of 1–3 carbon atoms; and R^8 is hydrogen or alkyl of 1–3 carbon atoms; n is zero or 1; R^4 and R^5 are independently hydrogen or alkyl of 1 to 3 carbon atoms; X is alkylene of 1 to 6 carbon atoms unsubstituted or substituted by hydroxy or a carboxylic acid group or a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof; Y is amino, or substituted amino, wherein the substituent is acyl, alkyl of 1 to 6 carbon atoms or a group =$C(R^{14})NR^{15}R^{16}$ wherein R^{15} and R^{16} are independently hydrogen or alkyl of 1 to 6 carbon atoms or a group —NR^AR^B wherein R^A and R^B are independently hydrogen or alkyl of 1 to 6 carbon atoms and R^{14} is hydrogen, alkyl of 1 to 6 carbon atoms.

4,428,962

INDOLES IN TREATMENT OF PEPTIC ULCERS

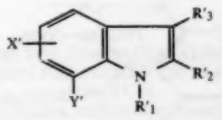
James A. Bristol, Ann Arbor, Mich., and Chester Puchalski, Dover, N.J., assignors to Schering Corporation, Kenilworth, N.Y.

Filed Oct. 30, 1981, Ser. No. 316,462

Int. Cl.[3] **C07D** *209/42, 209/08*; **A61K** *31/40*

U.S. Cl. 424—274 **33 Claims**

1. A compound represented by formula:



and pharmaceutically acceptable salts thereof, wherein

R'_1 represents hydrogen or methyl;

R'_2 represents methyl and R'_3 represents methyl, cyanomethyl, or amino;

X' represents hydrogen; and Y' represents phenylmethoxy, 2-phenylethyl or 3-phenyl-1-propenyl.

4,428,963
NOVEL THIOPHENE DERIVATIVES

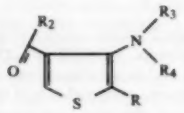
Pasquale N. Confalone, West Caldwell; Giacomo Pizzolato, Glen Ridge; Milan R. Uskokovic, Upper Montclair, all of N.J., and Marianne Rouge, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 318,779, Nov. 6, 1981, abandoned, which is a division of Ser. No. 111,637, Jan. 14, 1980, Pat. No. 4,317,915, which is a continuation-in-part of Ser. No. 889,459, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 820,521, Aug. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,853, Aug. 23, 1976, abandoned. This application Mar. 10, 1983, Ser. No. 474,072

Int. Cl.³ A61K *31/38*

U.S. Cl. 424—275 **10 Claims**

1. A process for reducing blood lipid levels in warm blooded animals which comprises administering an amount of a compound of the formula:



I

wherein R is lower alkyl; R_2 is hydrogen, hydroxy, lower alkoxy, or amino; R_3 and R_4 individually are lower alkyl, aryl, aralkyl or hydrogen; or a pharmaceutically acceptable salt thereof, in an amount effective for reducing blood lipid levels.

4,428,964
SULFINYL- AND SULFONYLACETANILIDES AND THEIR USE AS MICROBICIDES

Adolf Hubele, Magden; Peter Riebli, Basel, both of Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Manchester, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

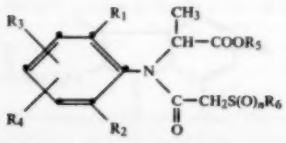
Filed Aug. 28, 1980, Ser. No. 182,197

Claims priority, application Switzerland, Aug. 29, 1979, 7831/79

Int. Cl.³ A01N *41/10*; C07C *147/13, 147/14*

U.S. Cl. 424—309 **17 Claims**

1. A compound of the formula I



(I)

wherein R_1 is C_1–C_3-alkyl, C_1–C_3-alkoxy or halogen; R_2 is C_1–C_3-alkyl, C_1–C_3-alkoxy or halogen; R_3 is hydrogen, C_1–C_3-alkyl or halogen; R_4 is hydrogen or methyl, R_5 is C_1–C_3-alkyl, R_6 is C_1–C_4-alkyl, and n is 1 or 2.

10. A method for combating phytopathogenic fungi which comprises applying to the locus of said fungi a fungicidally effective amount of a compound according to claim **1**.

4,428,965
TOLERIZING AND DESENSITIZING COMPOUNDS, COMPOSITIONS AND METHODS OF TREATMENT AGAINST DERMATOLOGICAL CONDITIONS CAUSED BY ALLERGENS FROM PLANTS AND TREES OF THE ANACARDIACEAE AND GINKGOACEAE FAMILIES

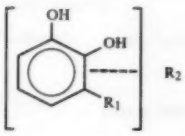
Mahmoud Elsohly; Edna S. Watson, and Coy W. Waller, all of Oxford, Miss., assignors to The University of Mississippi, University, Miss.

Filed May 31, 1979, Ser. No. 44,351

Int. Cl.³ A61K *31/22*; C07C *69/00*

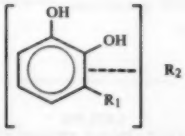
U.S. Cl. 424—311 **68 Claims**

1. Compounds effective for tolerizing and desensitizing against contact dermatitis caused by allergens contained in plants of the Anacardiaceae and Ginkgoaceae families comprising urushiol catechols and cell membrane residues conjugaged in vitro of the formula



wherein R_1 is an alkyl radical having 11 to 19 carbon atoms, or an unsaturated congener thereof; or mixtures thereof; and R_2 is a cell membrane residue.

44. The method of tolerizing and desensitizing mammals to allergens contained in plants of the Anacardiaceae and Ginkgoaceae families which consists essentially of administering to said mammal a composition consisting essentially of a compound or mixture of compounds having the formula:



wherein R_1 is an alkyl radical having 11 to 19 carbon atoms and the unsaturated congeners thereof and mixtures thereof; and R_2 is selected from the group consisting of an acyl ester functioning group hydrolyzable in vivo esterifying the catecholic hydroxy group and cell membrane residues in admixture with a non-toxic pharmaceutically acceptable carrier, said compound or mixture of compounds being in a therapeutically effective concentration.

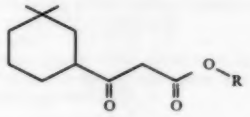
4,428,966

USE OF SUBSTITUTED CYCLOHEXYL CARBOALKOXY KETONE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

John B. Hall, Rumson, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 375,767, May 6, 1982. This application Mar. 10, 1983, Ser. No. 474,161
Int. Cl.³ A23L *1/235*
U.S. Cl. 426—3 2 Claims

1. A process for augmenting or enhancing the raspberry aroma or taste of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to a foodstuff or chewing gum from 0.5 parts per million up to about 100 parts per million based on the total weight of consumable material of at least one compound defined according to the structure:



wherein R represents C_1–C_3 lower alkyl.

4,428,967

PROCESSES FOR PRODUCTION OF WAXY BARLEY PRODUCTS

Kenneth J. Goering, and Robert F. Eslick, both of Bozeman, Mont., assignors to Research and Development Institute, Inc., at Montana State University, Bozeman, Mont.

Continuation-in-part of Ser. No. 47,855, Jun. 12, 1979, Pat. No. 4,311,714. This application Oct. 20, 1981, Ser. No. 313,242
The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.
Int. Cl.³ A23L *1/09*; A23J *1/12*
U.S. Cl. 426—28 37 Claims

1. A process for the production of a maltose syrup from starch-containing material obtained from waxy barley by conversion of components in the starch to form maltose, the steps of the process comprising:

(a) forming a 25–40 weight percent mixture of a waxy barley starch-containing material in water,;

(b) adding to said mixture a sufficient amount of an enzyme which contains at least an amylase to effect at least partial hydrolysis of the starch-containing material and form maltose and produce a resulting mixture containing these components;

(c) heating the resulting mixture to a temperature in the range of about 60°–76° C. for a sufficient period for the starch to dissolve so that starch granules do not remain in the resulting solution;

(d) cooling the resulting solution, adding an additional portion of an enzyme which contains at least an amylase and continuing contact for a sufficient time to effect additional starch conversion and form maltose and produce a resulting mixture of these components;

(e) heating the resulting mixture at a temperature of about 50° C. to 70° C. to substantially complete starch conversion; and

(f) separating and recovering the solids comprising proteins and liquids comprising a maltose syrup.

4,428,968

PREPARATION OF SAUERKRAUT UTILIZING HYDROLYZED PROTEIN

Jau Y. Hsu; Elaine R. Wedral, both of Brookfield, Conn., and William J. Klinker, Blue Island, Ill., assignors to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 18, 1982, Ser. No. 435,074
Int. Cl.³ A23L *1/218*
U.S. Cl. 426—49 3 Claims

1. A process for the production of flavored solid sauerkraut and sauerkraut juice which comprises fermenting cabbage in the presence of salt in an amount of from 1.0% to 4.5% by weight based on the weight of the cabbage and a powdered hydrolysed protein in an amount of from 1% to 10% by weight based on the weight of the cabbage wherein the total amount of salt present in the process is from 1.0% to 4.5% by weight based on the weight of the cabbage.

4,428,969

PROCESS FOR THE EXTRACTION OF DATE FRUITS

Hans Müller, Erlenbach; Rudolf Gayler, Zürich, and Nikolas Rapsomanikis, Männedorf, all of Switzerland, assignors to Chemap AG, Maennedorf, Switzerland

Filed Dec. 11, 1978, Ser. No. 970,125
Claims priority, application Switzerland, Jan. 3, 1978, 24/78
Int. Cl.³ A23K *1/14*
U.S. Cl. 426—53 8 Claims

1. Method of processing dates for extracting sweetening ingredient therefrom which comprises adding water to the dates to be processed, comminuting and homogenizing the date-water mixture, admixing the resultant date-water homogenizate with a cellulose containing material, filter aid subjecting the resultant admixture to filtration and recovering the extracted sweetening ingredient as filtrate.

4,428,970

MULTI-COLORED FREEZE-DRIED COFFEE AND A PROCESS FOR PRODUCING THE SAME

Raymond J. Laudano, Armonk, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,717
Int. Cl.³ A23F *5/32*
U.S. Cl. 426—385 5 Claims

1. A process for producing a freeze-dried coffee with a multi-colored appearance resembling that of roast and ground coffee which comprises:

(a) freezing a layer of aqueous coffee extract by a means which produces a dark-colored freeze-dried coffee;

(b) adding a thin layer of liquid water to the surface of the frozen coffee extract layer whereby the upper portion of said layer is melted;

(c) rapidly freezing solid the liquid added to the coffee extract layer and that portion of the layer that was melted;

(d) grinding the frozen coffee material of step (c);

(e) freeze drying the ground frozen coffee material of step (d).

4,428,971

PROCESS FOR THE PREPARATION OF A COMPOSITION FOR FROZEN OR DEEP-FROZEN SOUFFLÉS

Bernard Havette, Bresles, and Christian Hebert, Beauvais, both of France, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jul. 14, 1982, Ser. No. 397,980
Claims priority, application France, Jul. 29, 1981, 81 14751
Int. Cl.³ A23C *19/09, 19/093, 9/00, 9/06*
U.S. Cl. 426—565 6 Claims

1. A process for preparing frozen soufflé from a composition comprising a panada base, a flavouring base, egg yolk and a protein base which comprises:

(a) preparing a panada base by mixing flour with a fat, the amount of fat present being from 0.6 to 1 time the weight of the flour, and heating the mixture while stirring for 3 to 10 minutes at 80° to 100° C., adding seasonings and spices, water and dairy cream to provide a total of 1 to 2 times the weight of the flour, said panada base representing from 10 to 50% by weight of the composition;

(b) preparing a flavouring base comprising vegetables, cheese, fish, fruit and/or sugar, said flavouring base representing from 25 to 55% by weight of the composition;

(c) preparing a protein base by mixing egg white and lactic protein, the amount of lactic protein present being from 0.3 to 3 times the weight of the egg white, said protein base representing from 25 to 55% by weight of the composition;

(d) combining the panada base, the flavouring base and the protein base with egg yolk while avoiding whipping and the incorporation of air into the resulting composition, said egg yolk representing from 3 to 12% by weight of the composition;

(e) incorporating carbon dioxide in the composition at a temperature below 30° C. in a proportion of 0.5 to 2% by weight of the composition; and then

(f) subjecting the resulting composition to freezing conditions to produce the frozen souffle.

4,428,972

STARCH THICKENER CHARACTERIZED BY IMPROVED LOW-TEMPERATURE STABILITY

Otto B. Wurzburg, Whitehouse Station, N.J., and Virgil L. Fergason, Decatur, Ill., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 23, 1981, Ser. No. 314,311
Int. Cl.³ A23L *1/195*
U.S. Cl. 426—578 **14 Claims**

1. A process for preparing a thickened foodstuff comprising combining at least a foodstuff and a sol comprising water and an effective amount of a waxy starch from a plant of a wxsu2 genotype, and translocations, inversions, mutants and variants thereof, and cooking said combination as necessary to provide a thickened foodstuff, wherein said thickened foodstuff exhibits low-temperature stability and wherein said foodstuff prepared with said sol is capable of withstanding at lease one freeze-thaw cycle more than a foodstuff prepared with a native waxy starch from the respective plant which is not of a wxsu2 genotype.

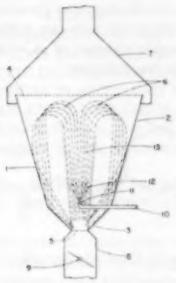
4,428,973

METHOD FOR THE HOMOGENEOUS COMPLETE ENCAPSULATION OF INDIVIDUAL GRAINS OF POURABLE MATERIAL AND APPARATUS FOR ITS PRODUCTION

Ernst L. Hörner; Jürgen C. Knolle, both of Eschwege, and Hans Grimm, Meinhard, all of Fed. Rep. of Germany, assignors to Saat- und Erntetechnik GmbH, Eschwege, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,651
Int. Cl.³ B32B *7/02*
U.S. Cl. 427—3 **14 Claims**

1. Method for the uniform, fully enclosing surface coating of individual particles of pourable materials having nearly uniform particle size with either a smooth, rough or scabrous serrated surface, in a fluidizing fountain with heated air under use of an inorganic and or organic coating material in the form of a suspension or solution, characterized in that a predetermined quantity of the material to be coated within a steep funnel-like upwards enlarged container, having a shorter less steep funnel-like lower segment located at the bottom of said upwards enlarged container by means of injection of a heated air stream at controlled velocity in ascending vertical direction is forming a fluidized fountain of limited height and diameter incident to the middle axis, thereby forming a core zone; injection from below and in the same direction as the heated air by means of one or several injection nozzles, located at the lower end of the container of the suspension or solution in an upward direction with a nozzle spray angle of between 30° and 60° at a predetermined mass/time ratio into the core stream of high volume concentration and the complete, uniform deposition of the suspension on the surface of the material, and simultaneous drying of the treated material during the ascent in the core zone and its descent within the peripheral, reduced air stream pressure, sliding along the vessel wall into the funnel-shaped lower container segment towards the fluidizing fountain and the repeated cycling of this processing step until the predetermined coating quantity has been applied and the drying of the



surface coated material to a prescribed moisture content, wherein said steep funnel-like, upwards enlarged container has either a circular or polygonal configuration whose upper portion constitutes a body of increasing diameter wherein the diameter ratio of the upper part, measured from the bottom to the top is in a ratio of 1:1.5 to 1:4.5 and said shorter less steep funnel-like lower segment opens into said upper portion and has sides which form an angle relative to the perpendicular of 20° to 50°, said container equipped at the upper and lower end with screen closures consisting of exchangeable screens of maximum free area with a mesh size smaller than the smallest particle of the material to be coated.

4,428,974

PROCESS FOR PRODUCING MAGNETIC RECORDING MATERIAL

Tsutomu Okita; Kyoichi Naruo, both of Fujinomiya, and Akira Ushimaru, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1982, Ser. No. 447,597
Claims priority, application Japan, Dec. 7, 1981, 56-195575
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **10 Claims**

1. A process for producing a magnetic recording material comprising the steps of:

coating on a support a composition containing a compound having an unsaturated bond polymerizable by irradiation with electron beams, an organic solvent capable of dissolving said compound, and a ferromagnetic powder;

irradiating the coated composition with electron beams in an atmosphere containing oxygen at a concentration of at least 10,000 ppm;

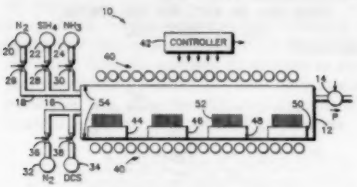
subjecting the surface of the resulting composition to a smoothening treatment utilizing a specular surface; and

irradiating the smoothened surface with electron beams in an atmosphere containing oxygen at a concentration of 3,000 ppm or less.

4,428,975
PROCESS FOR IMPROVING NITRIDE DEPOSITION ON A SEMICONDUCTOR WAFER

Jonathan C. Dahm, and John G. Franka, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1983, Ser. No. 461,715
Int. Cl.³ H01L 21/318
U.S. Cl. 427—94 **4 Claims**

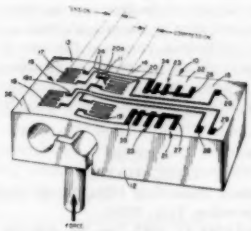


1. A method for using a tube having an inside surface which is coated with polysilicon, comprising:
heating said tube;
placing a semiconductor wafer in said tube; and
introducing ammonia and dichlorosilane into said tube to deposit nitride on said wafer.

4,428,976
GEOMETRIC BALANCE ADJUSTMENT OF THIN FILM STRAIN GAGE SENSORS

Walter H. Eisele, Malibu, Calif.; Helmut H. A. Krueger, Elgin, Ill.; Robert E. Lajos, Crystal Lake, Ill., and Donald J. Koneval, Arlington Heights, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 93,835, Nov. 13, 1979, Pat. No. 4,331,035. This application Apr. 1, 1982, Ser. No. 364,550
Int. Cl.³ G01B 7/20; G01L 1/22
U.S. Cl. 427—96 **9 Claims**

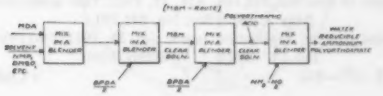


6. The method of forming a balanced thin film Wheatstone bridge strain gage (**11,21**) on a member (**12**) having a first portion subjected to tensional stress (**13**), a second portion subjected to compressional stress (**14**) and a third portion (**22**) not subjected to stress, and an insulative surface (**15**) on said first, second and third portions, said method comprising the steps of:
depositing a thin film resistive layer (**16,21**) on said insulative surface;
forming the resistive layer into (a) a Wheatstone bridge sensing resistor means (**16**) deposited on said first and second portions for providing a variable resistance as an incident of inflection of said member, and (b) an adjusting resistor means (**21**) deposited on said third portion and comprising a resistance (**30,31**) connected in series with at least one leg of said sensing resistor means, said adjusting resistor means being formed coplanarly adjacent said sensing resistor means; and
providing an electrical connection (**23**) to said adjusting resistor means to select any one of a plurality of different adjusting resistance values to be connected in series with said sensing resistor means (**16**) to effect accurate balance thereof.

4,428,977
AMMONIUM SALT OF PARITALLY IMIDIZED POLYAMIDE ACID FOR AQUEOUS COATING COMPOSITION

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 467615, May 6, 1974, Pat. No. 4,073,788, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Sep. 24, 1976, Ser. No. 726,247
Int. Cl.³ B05D 3/05; C08J 3/06; C08G 73/10, 73/14
U.S. Cl. 427—120 **35 Claims**



1. A water soluble composition comprising an ammonium salt of a polyimide precursor obtained by the steps of:
(a) forming an anhydrous mixture of 1,2,3,4 cyclopentanetetracarboxylic dianhydride reactant and a diamine reactant in a water miscible organic solvent wherein the reactants are in the molar ratio of about two-to-one;
(b) reacting said reactants at a temperature below that at which imidization occurs to form an amide acid intermediate having two free carboxyl groups each ortho to an amide group;
(c) heating said intermediate at a temperature of about 90° C. or above and removing water of condensation for a period of time sufficient to partially imidize said amide acid intermediate to an imidization level greater than a negligible amount up to but not more than 56% to provide the desired viscosity of the final polyamide acid polymer solution; and
(d) further reacting said partially imidized amide acid intermediate with a reactant of the character of the original reactant initially present in the lesser amount at a temperature below that at which imidization occurs, with said additional reactant being in a molar amount equal to the molar amount of said lesser initial reactant, the total amounts of 1,2,3,4 cyclopentane-tetracarboxylic dianhydride reactant and diamine reactant being sufficient to produce a polyimide precursor solution having a solids content of between about 25% and about 70% by weight; and
(e) reacting said polyimide precursor solution with a volatile ammonium base to render said precursor water soluble, and diluting said solution with water.

4,428,978
CONCENTRATED MICROCAPSULE SUSPENSIONS FOR REACTION COPYING PAPERS

Gert Jabs, Odenthal; Günther Baatz, Buxheim; Manfred Bock; Manfred Dahm, both of Leverkusen; Artur Haus, Overath, and Christian Wegner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,537
Claims priority, application Fed. Rep. of Germany, May 28, 1980, 3020148
Int. Cl.³ B01J 13/02; B41M 3/12; C09D 11/02
U.S. Cl. 427—150 **3 Claims**

1. In the process of producing an aqueous suspension containing from 35 to 60% by weight of microcapsules by interfacial polyaddition of polyisocyanate and a hydrogen active compound, the improvement wherein (a) an isocyanurate-modified aliphatic polyisocyanate is used as the polyisocyanate

and (b) the suspension is adjusted to a pH value of ≦7 after the polyaddition reaction.

2. The process of claim 1 wherein the microcapsules contain dye precursors.

3. A method for producing a completely or partly coated copying system by the rotogravure or flexograph processes employing a printing ink wherein the microcapsule suspension produced by the process of claim 2 is a constituent of the printing ink.

4,428,979

METHOD FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER

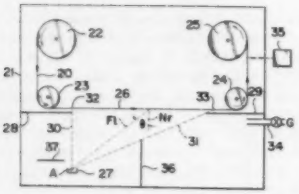
Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Isao, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 373,144, Apr. 29, 1982. This application May 3, 1983, Ser. No. 491,791

Claims priority, application Japan, Jul. 31, 1981, 56-119149

Int. Cl.³ G02B *1/10*; B05D *5/06*

U.S. Cl. 427—162 **4 Claims**



1. A method for forming an inhomogeneous optical layer on a surface of a substrate, in which, while the substrate is moved along a travelling path having a path section or a number of path sections, an evaporation substance evaporated from its source means is deposited on said surface with the deposition rate being varied monotonously along the travelling path in the path section or each of the path sections, and the deposited evaporation substance is exposed to reaction gas which is able to react on the evaporation substance.

4,428,980

METHOD FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER

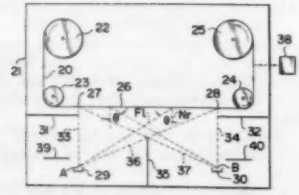
Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Isao, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 373,145, Apr. 29, 1982. This application May 3, 1983, Ser. No. 491,792

Claims priority, application Japan, Jul. 31, 1981, 56-119150

Int. Cl.³ G02B *1/10*; B05D *1/34, 5/06*

U.S. Cl. 427—162 **2 Claims**



1. A method for forming an inhomogeneous optical layer on a surface of a substrate, in which, while the substrate is moved along a travelling path having a path section or a number of path sections, two different evaporation substances evaporated from their respective source means is deposited on said surface with the deposition rate of each of these substances being varied monotonously along the travelling path in the path section or each of the path sections.

4,428,981

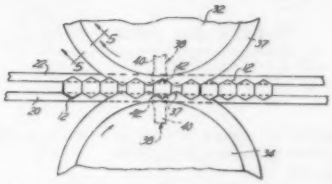
METHOD AND APPARATUS FOR MAKING FRICTION LOCKING THREADED FASTENERS

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed May 10, 1982, Ser. No. 376,764

Int. Cl.³ B05D *1/02*

U.S. Cl. 427—195 **7 Claims**



1. The method of treating headed, externally threaded fasteners to provide deposits of thermoplastic friction material extending completely around the fasteners in annular friction zones intermediate the ends of the threaded portions, located primarily in the thread grooves thereof, in which the deposits extend from the bottoms of the thread grooves substantially to the crests of the adjacent threads, which comprises advancing a series of fasteners horizontally suspended by the heads of the fasteners between laterally spaced flexible belts with the threaded shanks of the fasteners extending vertically below the belts, advancing the fasteners through a heating zone in which the threaded shanks are heated to above the fusion temperature of the thermoplastic material, advancing the fasteners between a pair of rotating wheels having yieldable peripheries and occupying the plane of the heads of the fasteners to impart a spin to the fasteners as they traverse a particle application zone, and directing a stream of thermoplastic particles against the sides of the shanks of the fasteners as they traverse the application zone, and relating the rate of advance of the fasteners through the application zone and the rate of spin to the dimension of the application zone in the direction of advance of the fasteners so as to cause the deposit of particles to extend completely around the fasteners to form annular friction zones.

4,428,982

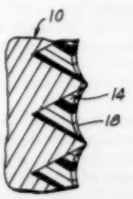
THREAD LOCK

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed May 17, 1982, Ser. No. 379,110

Int. Cl.³ B05D *1/36*

U.S. Cl. 427—202 **12 Claims**



1. The method of mass producing self locking threaded fasteners having material deposited in thread grooves thereof to be activated by engagement with a mating threaded member, which comprises

continuously advancing a series of threaded fasteners,

depositing in thread grooves of the fasteners as they continue to advance a fluid locking material capable of activation by engagement with mating threaded members to oppose disengagement between mated fasteners and members,

applying over the entire exposed surface of the fluid locking material in thread grooves of the fasteners a continuous thin coating of a fluid film-forming material as the fasteners continue to advance,

and applying a quick-acting film-activating material throughout the exposed surface of the film-forming material as the fasteners continue to advance to convert the fluid film-forming material to a thin continuous non-tacky protective film over the still fluid deposits of locking material in the thread grooves of the fasteners.

4,428,983

PROCESS FOR THE PRODUCTION OF MICROCAPSULES

Ulrich Nehen, Leverkusen; Manfred Hajek, Cologne; Norbert Weimann, and Manfred Dahm, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,923

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039117

Int. Cl.³ B01J *13/02*; B05D *7/00*

U.S. Cl. 427—213.34 **6 Claims**

1. A process for encapsulating products in a polymer by interfacial polymerization, in which a stabilized dispersion of droplets of a first liquid which is to be encapsulated or a stabilized dispersion of solid particles which are to be encapsulated is formed in a continuous phase of a second liquid, and wherein one of the two capsule wall-forming reaction components is present in free form and contains at least two isocyanate groups while the other of the two capsule wall-forming reaction components is present in reversibly blocked form and contains at least two reversibly blocked functional groups which are deblocked by water and contain at least two NH groups or one NH-group and one OH-group, both reaction components are present in the first or second liquid without reacting with one another and the reaction component which is present in reversibly blocked form is deblocked by means of water present in the second or first liquid and then reacts with the reaction component present in free form to form a polymeric capsule wall, the droplets of the first liquid or the solid particles being encapsulated in small capsules consisting of polymeric material.

4,428,984

METHOD OF PREVENTING DUSTS

Hirozumi Shimizu, Yokohama; Noboru Kiso, Osaka, and Taizo Igarashi, Amagasaki, all of Japan, assignors to Nippon Oil and Fats Co., Japan

Continuation of Ser. No. 202,875, Oct. 31, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,367

Claims priority, application Japan, Nov. 7, 1979, 54-143200

Int. Cl.³ C09K *3/22*

U.S. Cl. 427—220 **13 Claims**

1. A method of preventing dust comprising spreading an aqueous solution consisting essentially of water and 0.01–10% by weight of each of a nonionic surface active agent and a polyhydric alcohol on the substances which develop dust, said nonionic surface active agent being selected from polyoxyethylene alkyl ether, polyoxyethylene alkylphenyl ether and polyoxyethylene fatty acid ester, and said polyhydric alcohol being selected from ethylene glycol, glycerine, sorbitol and polyethylene glycol.

4,428,985

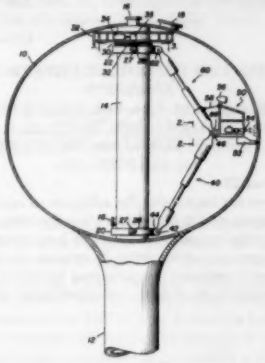
METHOD FOR INSIDE COATING DOUBLE CURVED SHELL

Luciano F. Bertolazzi, Wheaton, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Division of Ser. No. 345,040, Feb. 2, 1982, Pat. No. 4,377,128. This application Jan. 17, 1983, Ser. No. 458,184

Int. Cl.³ B05D *7/22, 1/02*

U.S. Cl. 427—230 **7 Claims**



1. A method of applying a coating to the inside surface of a double-curved shell which is circular in horizontal section, comprising:

positioning apparatus in the shell having a work platform for coating equipment; a first extendable and retractable leg in compression joined at its upper end to the platform and joined at its lower end through a horizontal axis pivot to first means rotatable about a vertical axis, through the center of the shell, on a lower fixed base; and a second extendable and retractable leg in tension joined at its lower end to the platform and joined at its upper end through a horizontal axis pivot to means rotatable about a vertical axis, through the center of the shell, on an upper fixed base spaced upwardly from the lower fixed base whereby the lower end of the first leg and the upper end of the second leg can rotate about the same vertical axis;

extending or retracting the first and second legs to position the work platform adjacent the shell surface;

rotating the apparatus about its vertical axis while applying a coating from the work platform to the shell surface as a horizontal band extending circumferentially around the shell surface;

extending or retracting the first and second legs to position the work platform adjacent an area of the shell surface which has not been coated;

rotating the apparatus about its vertical axis while applying a coating from the work platform to the shell surface as a second horizontal band extending circumferentially around the shell surface; and

repeating the described application of coating bands until a substantial portion of the shell surface is coated.

4,428,986

METHOD OF PREPARING A BERYLLIA SUBSTRATE FOR SUBSEQUENT AUTOCATALYTIC DEPOSITION OF A METALLIZED FILM DIRECTLY THEREON

Steven R. Schachameyer, Whitefish Bay, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 18, 1982, Ser. No. 442,556

Int. Cl.³ B05D *3/04*

U.S. Cl. 427—309 **14 Claims**

1. A method of preparing a beryllia substrate for a subsequent autocatalytic deposition of a metallized film directly

thereon comprising chemically etching the substrate to roughen the surfaces thereof,

said chemical etching comprising the steps of exposing said substrate to a solution in which beryllia is soluble for establishing a uniform surface profile for the substrate, then rinsing the substrate with a neutral solution, and then exposing the substrate to a solution in which other constituents of the substrate are soluble to remove said other constituents from the grain boundaries of the beryllia at the surface of the substrate.

4,428,987

PROCESS FOR IMPROVING COPPER-EPOXY ADHESION

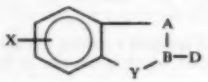
James P. Bell, and Jae M. Park, both of Storrs, Conn., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 28, 1982, Ser. No. 372,588

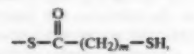
Int. Cl.³ B05D *3/14*

U.S. Cl. 427—327 **9 Claims**

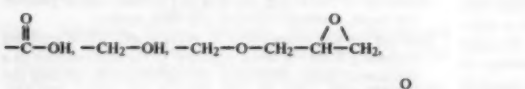
1. A process for improving the adhesion of epoxy resins to a copper substrate which comprises (1) subjecting the substrate to cathodic polarization of from about 1 to about 15 volts for from about one second to about 15 minutes in an electrolytic bath and then immersing the polarized substrate in a 0.001 to 0.1 molar solution of at least one compound of the general formula:



wherein
A is a —N= or —S—,
B is a —N= or —C=,
Y is a —N= or NH=,
D is H, —SH, —SR,



or R wherein R is an alkyl or aryl radical, and m is an integer from 0 to 10, and X is H, $-NH_2$,



or —OH for from about 1 second to about one hour.

4,428,988

ILLUMINATED ORNAMENTAL STRUCTURE OF INTERPOSED TRANSMISSIVE SLATS AND COLLARS

Peter J. Adinamis, 7035 N. Tripp Ave., Lincolnwood, Ill. 60646

Filed Jun. 1, 1981, Ser. No. 269,399

Int. Cl.³ F21V *7/04*

U.S. Cl. 428—8 **8 Claims**

1. An ornamental illuminated artificial Christmas tree which comprises:

a conical hollow cylindrical post constructed of light transmitting material;

a plurality of slat-like members, each having a hole therethrough, each of the members being constructed of light transmitting material and mounted with the post extending through the holes, each of said members being self-supporting;

a plurality of circular collars mounted on said post, each of said collars being constructed of light transmitting material and each mounted to encircle the circumference of said post in positions interposed between said slat-like members for supporting said slat-like members in non-contacting relation; and

means mounted within said post for illuminating the entire length of said post and transmitting light from the post to the slat-like member and collars assembled on the post.

4,428,989

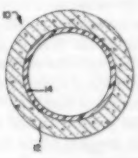
ANTI-FOULING AND ANTI-SLIMING GEL COAT

David W. Marshall, North Reading, Mass., assignor to Kennecott Corporation, Stamford, Conn.

Continuation of Ser. No. 187,318, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 46,904, Jun. 8, 1979, abandoned, which is a division of Ser. No. 886,951, Mar. 15, 1978, Pat. No. 4,197,233. This application Jun. 21, 1982, Ser. No. 390,663

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—35 **58 Claims**



1. A marine structure having an anti-sliming and anti-fouling surface thereon, said anti-sliming and anti-fouling surface comprising a cured resin formed from an epoxy resin coreacted with an epoxidized polyol and a curing agent, said cured resin containing copper flake, said copper flake being treated to remove impurities and oxides and being present in sufficient quantities so the copper flake comprises 50% or more of the weight of the surface.

4,428,990

TRAFFIC ACCESSORY

Christopher H. Edwards, Pretoria, South Africa, assignor to Trafftrans (Proprietary) Limited, Pretoria, South Africa

Filed May 11, 1982, Ser. No. 377,096

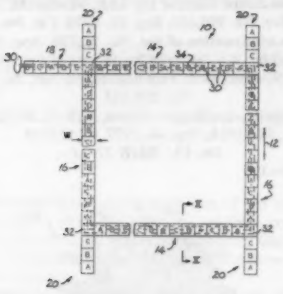
Claims priority, application South Africa, May 14, 1981, 81/3224

Int. Cl.³ B32B *7/06*

U.S. Cl. 428—41 **3 Claims**

1. A traffic accessory in the form of an inductive loop for a traffic control or traffic monitoring device and temporarily and repeatedly attachable to a road surface, which comprises a

loop in the form of a flattened strip to permit vehicles to drive over it and which has a pair of major surfaces, one of which is provided with a plurality of adhesive zones for use as the lower surface of the accessory for attachment to the road surface, the strip having an electrical lead extending lengthwise along it in the form of one or more coils, at least some of the zones being



provided with individually removable release sheets, whereby they are rendered non-adhesive, the release sheets being divided into a plurality of groups by being marked distinguishably and the sheets of each group being substantially evenly distributed amongst the sheets of the other group or groups, the groups each having substantially the same number of sheets

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4,428,991

PLATE-SHAPED INSULATION MEMBER AND A METHOD FOR MANUFACTURING SUCH A MEMBER

Jorgen Kamstrup-Larsen, Allerod, Denmark, assignor to Superfos Glasuld A/S, Vedbaek, Denmark

Filed Mar. 9, 1979, Ser. No. 19,145

Claims priority, application Denmark, Mar. 15, 1978, 1172/78; Sep. 13, 1978, 4032/78

Int. Cl.³ B32B *3/10, 31/00, 5/12, 3/28*

U.S. Cl. 428—44 **12 Claims**

1. An insulation member shaped as a body having planar first and second major surfaces generally parallel to each other, the body comprising a plurality of rectangular blocks, each block having a plurality of generally mutually parallel relatively short lengths of mineral wool, said blocks being in contiguous abutting relationship along their long edges without any adhesive binder between adjacent blocks, said mineral wool fiber planes extending between said first and second major surfaces and substantially perpendicular to those major surfaces;

said major surfaces being open to expose the mineral wool in said blocks without any covering over either major surface; said body having a plurality of closed spaces therein and being free of any adhesive binder mixed throughout the mass of fibers;

a plurality of generally parallel grooves of narrow width and shallow depth relative to the thickness of said body formed on at least one major surface and extending transverse to the longitudinal direction of the mineral wool strips;

reinforcing means in said grooves comprising elongate flexible strips or string-like connecting means secured therein by an adhesive bond for joining together said blocks without the need for any further connecting means at said major surfaces or on the abutting sides of the individual blocks to hold the body together for handling.

4,428,992

METHOD OF SPLICING REINFORCEMENT FIBER

Sidney W. Street, Hacienda Heights, Calif., assignor to Hitco, Irvine, Calif.

Filed Nov. 21, 1981, Ser. No. 320,512

Int. Cl.³ B65H *19/18, 69/02, 69/06*

U.S. Cl. 428—114 **23 Claims**

1. A method of splicing a reinforcement fiber for reinforcing a composite with a matrix resin comprising the steps of

applying to the ends of two of said fibers a solution of linear polyimide having a glass transition temperature of at least 200° C. dissolved in a fast evaporating solvent having a boiling point below 150° F.; said polyimide being insoluble in the solvent utilized to dissolve said matrix resin, having high heat resistance and being compatible with said matrix resin;

placing the coated ends in contact;

drying the solution to remove said fast evaporating solvent in less than one minute to form a continuous splice of said polyimide joining said ends.

18. A fiber-reinforced resin matrix article comprising filamentary reinforcement fiber containing a splice formed by coating overlapped ends of the fiber with a linear, aromatic polyimide having a glass transition temperature of at least 200° C., said polyimide being dried from solution in a fast evaporating solvent having a boiling point less than 100° F., being insoluble in solvents for the matrix resin, having a high heat resistance and being compatible with said matrix resin.

4,428,993

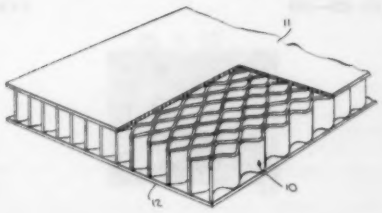
STRUCTURAL LAMINATE WITH EXPANDED WOOD CORE

Henri A. Kohn, Northvale, N.J., and Hugo Spahn, Wappingers Falls, N.Y., assignors to Baltek Corporation, Northvale, N.J.

Filed May 11, 1982, Ser. No. 377,037

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—117 **7 Claims**



1. A structural sandwich constituted by a core of expanded wood whose faces have skins laminated thereto, said core comprising an array of wood strips die cut from a block of end grain balsa wood and having a periodic wave formation, the upper and lower edges of the strips being bonded to the skins whereby the substantially parallel fibers of the balsa wood are normal to the skins to resist compressive forces, the wavy strips in the array being out of phase with each other and being

bonded together at their abutting troughs and peaks to define open-ended cells, whereby the laminate is light in weight and of high strength.

4,428,994

ANTI-GRAFFITI FACING OF WALLS OR SIMILAR SURFACES

Patrick R. Rawlins, Oxford, England, assignor to Hubdean Limited, Oxford, England

Filed Jul. 15, 1981, Ser. No. 283,605

Claims priority, application United Kingdom, Jul. 19, 1980, 8023700

Int. Cl.³ B32B *3/00;* **B05D** *5/00*

U.S. Cl. 428—164 **21 Claims**

21. A surface facing having a coloured and textured exposed surface on which graffiti cannot be easily applied, and if successfully applied, from which it can be readily obliterated, said surface facing being formed by

(a) applying to the surface to be faced a first layer of a priming and sealing coating composition which contains an aggregate material and a bonding agent, said first layer adhering to the surface to be faced and providing an exposed adhesive surface to which a second layer of coating material will readily adhere,

(b) applying to the exposed surface of said first layer a second layer of a further coating composition which contains an aqueous mixture of a plaster material, a binding agent, a filler for hardening the further coating composition and a water-soluble colouring dye, said second layer providing an exposed surface which, prior to hardening, can be textured,

(c) texturing the exposed surface of said second layer so as to provide a relief thereon,

(d) allowing said second layer to harden such that the textured, exposed surface thereon will become resistant to indentation and cutting, and

(e) applying over the textured, exposed surface of said hardened second layer a finishing layer of a cellulose-based coating, said finishing layer containing colouring matter and having a colour which is substantially the same as the colour of said further coating composition.

4,428,995

GLASS CLOTH AND PREPREG CONTAINING SAME

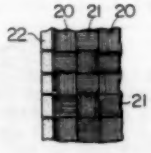
Haruki Yokono, Yuki, and Tsugihiko Hiratsuka, Shimodate, both of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,582

Claims priority, application Japan, Sep. 30, 1981, 56-146282[U]; Sep. 30, 1981, 56-146283[U]; Sep. 30, 1981, 56-146284[U]

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—193 **5 Claims**



1. A prepreg which comprises a glass cloth impregnated with a thermosetting resin varnish followed by heating and drying to form a B-stage thermosetting resin varnish impregnant therein, said glass cloth comprising warp yarns each consisting of a number of glass monofilaments and weft yarns each consisting of a number of glass monofilaments, said warp yarns being interwoven with said weft yarns and the weft yarns being cut at the ends of the glass cloth; both cut ends of the weft yarns having fixed portions of the glass monofilaments formed by bonding the cut ends of the weft yarns together whereby breakage of the cut ends is prevented.

4,428,996

DIAPHRAGM FOR SPEAKER

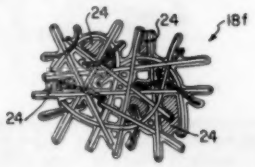
Yasushi Miyoshi, Bisai, and Yasuhiro Ishii, Gufu, both of Japan, assignors to Sanyo Electric Co. Ltd., Moriguchi, Japan

Division of Ser. No. 190,416, Sep. 24, 1980, Pat. No. 4,308,094, which is a continuation of Ser. No. 32,730, Apr. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 873,614, Jan. 30, 1978, abandoned. This application Jun. 24, 1981, Ser. No. 275,813

Claims priority, application Japan, Feb. 2, 1977, 52-11913; Feb. 2, 1977, 52-11914; Sep. 16, 1977, 52-112329

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **8 Claims**



1. A speaker diaphragm comprising: a base formed of fibers of pulp and of carbon fibers, said carbon fibers comprising at least 50% by weight of the base, and

a layer of electroless plated metal on said base which binds the fibers together at their intersections.

4,428,997

PROTECTIVE COATINGS FOR DOCUMENTS

Joseph Shulman, Hyde Park, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1979, Ser. No. 107,415

Int. Cl.³ B32B *3/18, 27/28;* **B41M** *3/14*

U.S. Cl. 428—202 **4 Claims**

1. A protective coating assembly for an information bearing document comprising a polyester carrier sheet peelably bonded to an arrangement of two noncohesive layers of a polyethylene-acrylic acid resin adhesive sandwiching an arrangement of a tightly printed pattern of a nacreous pigment composition.

4,428,998

LAMINATED SHIELD FOR MISSILE STRUCTURES AND SUBSTRUCTURES

Elden L. Hawkinson, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 106,412, Dec. 21, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,330

Int. Cl.³ B32B *5/26, 5/32, 5/16*

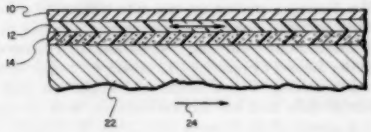
U.S. Cl. 428—240 **4 Claims**

1. An impact protected missile structure comprising:

a structural wall of a missile having a longitudinal axis;

a protective composite laminate comprising multiple layers

bonded to each other at the interface between them, the laminate having an outer fabric layer with at least one first ply of aramid fiber woven fabric having at least about 80% to 90% of the fibers extending generally parallel to the longitudinal axis of the missile wall structure; a fabric sub-layer having at least one second ply of aramid fiber woven fabric, the fibers woven in a more uniform pattern than the outer fabric layer; a layer of finely divided hol-



low microspheres coating a surface of the second fabric layer; and a synthetic resinous material containing an elastomeric component binding the outer fabric layer, the fabric sub-layer and the layer of microspheres together in a rubbery matrix; and

means bonding the laminate to the exterior of the missile wall structure so the outer fabric layer is on the side of the fabric sub-layer opposite the missile wall structure.

4,428,999

REFRACTORY COATED AND VAPOR BARRIER COATED FLAME RESISTANT INSULATING FABRIC COMPOSITION

Stephen George, and Thomas H. George, both of Clinton, N.J., assignors to Textured Products, Hartsdale, N.Y.

Continuation-in-part of Ser. No. 294,771, Aug. 20, 1981, Pat. No. 4,358,500. This application Jan. 12, 1982, Ser. No. 338,850
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.
Int. Cl.³ B32B *7/00;* **B05D** *3/02*
U.S. Cl. 428—246 **15 Claims**

1. A heat resistant, flexible refractory insulating composition comprising:

(a) a base fabric;

(b) a refractory coating comprising refractory materials, said refractory coating formed on one side of said fabric, said refractory materials being capable of fusing with the base fabric at elevated temperatures; and

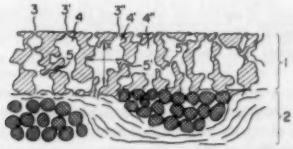
(c) a vapor barrier coating formed on the other side of said fabric wherein said vapor barrier coating is urethane resin, acrylic resin, epoxy resin, silicone resin, polyimide resin, polyamideimide resin, or polyester resin.

4,429,000

MOISTURE-PERMEABLE WATERPROOF COATED FABRIC AND METHOD OF MAKING THE SAME

Yasushi Naka, Hirakata, and Kiyoshi Kawakami, Kyoto, both of Japan, assignors to Toray Industries, Inc., Japan

Continuation of Ser. No. 102,410, Dec. 11, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,615
Int. Cl.³ B32B *27/40*
U.S. Cl. 428—265 **12 Claims**



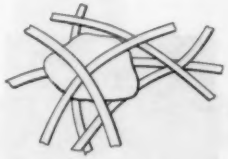
1. A moisture-permeable water-proof fabric comprising a base fabric and a microporous layer formed on at least one face of said base fabric, characterized by having a water entry pressure not lower than 700 mmH_2O/cm^2 and a moisture-vapor transmission not lower than 2500 g/m^2-24 hrs., said microporous layer being formed by wet coagulation using a polar organic coating solution containing (a) from about 8 to about 25 percent by weight of polyurethane elastomer, (b) from about 0.1 to about 10 percent by weight of a water repellent agent, (c) from about 0.2 to about 3 percent by weight of polyisocyanate and (d) from about 1 to about 8 percent by weight of a nonionic surfactant.

4,429,001

SHEET PRODUCT CONTAINING SORBENT PARTICULATE MATERIAL

Barbara E. Kolpin, River Falls, Wis., and David C. Brownlee, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 4, 1982, Ser. No. 354,806
Int. Cl.³ D04G *1/56, 1/72*
U.S. Cl. 428—283 **25 Claims**



1. A sorbent sheet product comprising a coherent web of entangled melt blown fibers and an array of solid high-sorbency liquid-sorbent polymeric particles uniformly dispersed and physically held within the web, said particles swelling upon sorption of liquid and the web expanding as the particles swell with sorbed liquid.

4,429,002

BULKY NON-WOVEN FABRIC OF POLYBUTYLENE TEREPHTHALATE CONTINUOUS FILAMENTS

Shunsuke Fukada, Kusatsu; Kiyoshi Aihara, Otsu, and Hideo Ibaragi, Omihachiman, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 271,221, Jun. 8, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,617
Claims priority, application Japan, Jun. 13, 1980, 55-78921
Int. Cl.³ B32B *27/34;* **D04H** *1/04*
U.S. Cl. 428—287 **21 Claims**

1. A continuous filament non-woven fabric having an apparent density less than 0.7 g/cc under a load of 0.5 g/cm^2,

(a) 50 to 98% by weight of randomly disposed continuous filaments of a polybutylene terephthalate polymer, said continuous filaments of polybutylene terephthalate polymer having a three-dimensional crimp of unfixed shape and a crimp extensibility greater than about 5%; and

(b) 2 to 50% by weight of bonding component filaments of

a polybutylene terephthalate co-polymer comprising about 30 to 80 mol% polybutylene terephthalate units and having a melting point at least 30° C. lower than the respective melting point of said continuous filaments;

wherein said crimp is oriented in the direction of the thickness of said fabric and the continuous filaments are laminated and bonded by means of said bonding component filaments.

4,429,003

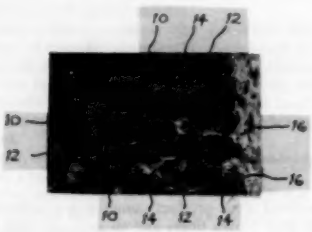
PROTECTIVE COATING FOR POROUS REFRACTORIES

John I. Fredriksson, Holden; John D. Morrow, Worcester, and Giulio A. Rossi, Shrewsbury, all of Mass., assignors to Norton Co., Worcester, Mass.

Filed Oct. 5, 1981, Ser. No. 308,697

Int. Cl.³ F23Q 7/10

U.S. Cl. 428—317.9 10 Claims



10. A sintered silicon carbide resistance igniter, said igniter having a body with open and interconnected pores having entrances to said pores exposed on the surface thereof including a silicon oxide layer that covers the surface of the body and extends at least into the entrances to said pores which silicon oxide was produced in situ upon the selective oxidation of fine particles of silicon carbide positioned on the surface of the igniter and impregnated deeply into the pores in the igniter body, which silicon carbide particles having been deposited on the surface and within the pores while in a liquid suspension, and said silica layer blocking the pores within said body against oxidation of a portion of said sintered silicon carbide whereby to produce a self healing igniter should any of the surface coating be displaced.

4,429,004

LIGHT-REFLECTING BODY

Franz Breitenfellner, 6140 Bensheim, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,800

Claims priority, application Switzerland, Jun. 26, 1980, 4913/80

Int. Cl.³ B32B 5/16, 15/08; F21V 7/22; G02B 5/08

U.S. Cl. 428—324 4 Claims

1. A light-reflecting body having a wall and a reflecting metal layer on at least one surface of the wall either directly or on top of the lacquer layer, said wall consisting of

(a) 90–70% by weight of poly(1,4-butylene terephthalate) or a copolyester based on 1,4-butylene terephthalate, and

(b) 10–30% by weight of a finely divided filler which is kaolin or mica, and wherein the filler has a particle size of not more than 30 microns.

4,429,005

ADHESIVE FOR SOLAR CONTROL FILM

Howard J. Penn, Cook County, Ill., assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 292,225, Aug. 12, 1981. This application Jun. 14, 1982, Ser. No. 388,488

Int. Cl.³ C09J 7/02

U.S. Cl. 428—350 2 Claims

1. A solar film for adherence to glass for solar control, said solar film having a coating on one side thereof of a water-activatable adhesive comprising the reacted product of (A) gamma-isocyanatopropyltriethoxy silane and (B) a thermoplastic polyester formed by reacting (i) a dibasic acid selected from the group consisting of terephthalic acid, isophthalic acid, and hexahydrophthalic acid and mixtures thereof, with (ii) a polymethylene glycol of the formula $HO(CH_2)_xOH$ where x is an integer from 2 to 10, neopentyl glycol and glycerin, and mixtures thereof, and (iii) an aliphatic dibasic acid selected from the group consisting of those having the formula $HOOC(CH_2)_nCOOH$ where n is an integer from 1 to 8, and mixtures of such acids, in which substantially no free isocyanate (NCO) remains in the adhesive.

4,429,006

FILAMENT-LIKE FIBERS AND BUNDLES THEREOF, AND NOVEL PROCESS AND APPARATUS FOR PRODUCTION THEREOF

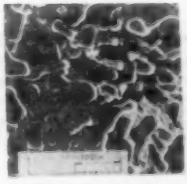
Susumu Norota; Tsutomu Kiriyama; Tadashi Imoto, and Toshinori Azumi, all of Iwakuni, Japan, assignors to Teijin Limited, Tokyo, Japan

Division of Ser. No. 133,288, Mar. 24, 1980, Pat. No. 4,355,075. This application Jul. 2, 1982, Ser. No. 394,892

Claims priority, application Japan, Mar. 27, 1979, 54-35008; Mar. 27, 1979, 54-35009; Jul. 16, 1979, 54-89315; Sep. 4, 1979, 54-112370

Int. Cl.³ D02G 3/00

U.S. Cl. 428—373 6 Claims



1. A bundle of numerous melt-spun filaments, said bundle of filaments being composed of at least one thermoplastic synthetic polymer and being characterized in that

(1) each of said filaments constituting said bundle has

(a) a non-circular cross-section varying irregularly in both the size and shape of the cross-section at irregular intervals along its longitudinal direction, and

(b) a coefficient of intrafilament cross-sectional area variation [CV(F)] of 0.08–0.7, and

(2) said bundle of filaments has an intrabundle filament cross-sectional area variation coefficient [CV(B)] of 0.1–1.5.

4,429,007

ELECTRICAL WIRE INSULATION AND ELECTROMAGNETIC COIL

George J. Bich, Penn Hills, and Tapan K. Gupta, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 21, 1981, Ser. No. 313,448
Int. Cl.³ C03C 3/10; H01B 3/08, 7/00
U.S. Cl. 428—389 9 Claims

1. An insulated electrical conductor comprising, in combination, a metallic conductor and an insulating coating applied to the metallic conductor, the coating having been derived by applying to the conductor a liquid slurry comprising:

(A) 15–55 solids weight percent a glass powder having a composition of:
40–60 wt.% SiO_2;
6–13 wt.% Na_2O;
2–6 wt.% Al_2O_3;
3–10 wt.% CaO;
15–25 wt.% BaO; and
2–10 wt.% Y_2O_3;

(B) 15–65 solids weight percent an inorganic filler selected from the group consisting of alumina, magnesia, zirconia or silica;

(C) 30–50 solids weight percent of an organic binder; and

(D) sufficient organic solvent to dissolve the organic binder; and by exposing said coated conductor to heat whereby said solvent and said organic binder are evaporated and further heating said conductor causing said coating to adhere to said conductor.

9. A process for the preparation of a conductor as described by claim 1, 2 or 3 which process is substantially:

(A) maintaining the slurry coated conductor at room temperature for 6 hours to dry out water and to allow the potting compound to dry;

(B) heating the conductor at 2° C. per minute or less to 100° C. to vaporize all residual moisture;

(C) maintaining said conductor at 100° C. for 16 hours;

(D) heating said conductor at 2° C. per minute or less to 125° C.;

(E) maintaining said conductor at 125° C. for 8 hours;

(F) heating said conductor at 2° C. per minute or less to a temperature between 370° to 375° C. to reduce the organic binder to the monomer state and to vaporize the monomer;

(G) maintaining said conductor at 370° to 375° C. for 16 to 20 hours;

(H) heating said conductor at 2° C. per minute or less to 450° C.;

(I) maintaining said conductor at 450° C. for 4 hours to eliminate any carbonaceous material present;

(J) heating said conductor to 750° C. to 790° C. at 2° C. per hour or less;

(K) maintaining said conductor at 750° C. to 790° C. for 8 to 10 hours to vitrify the glass;

(L) cooling said conductor to 450° C.;

(M) maintaining said conductor at 450° C. for 16 hours; and

(N) cooling said conductor to room temperature.

4,429,008

THIOL REACTIVE LIPOSOMES

Frank J. Martin, San Francisco; Demetrios P. Papahadjopoulos, Lafayette, and Wayne L. Hubbell, Orinda, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 10, 1981, Ser. No. 329,211
Int. Cl.³ B01J 13/02; B32B 9/02
U.S. Cl. 428—402.2 10 Claims

1. A composition, useful for conjugation with ligands bearing thiol groups, comprising:

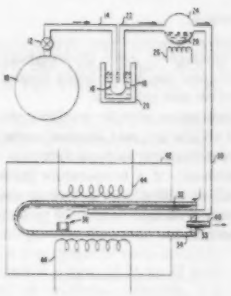
liposomes, each liposome having a lipid bilayer defining an outer surface for the liposome, and a plurality of thiol reactive groups integrally connected to the lipid bilayer and extending outward with respect to the outer surface.

4,429,009

PROCESS FOR SURFACE CONVERSION OF VITREOUS SILICA TO CRISTOBALITE

Ricardo C. Pastor, Manhattan Beach; Luisa E. Gorre, Oxnard; Antonio C. Pastor, Santa Monica, and Remedios K. Chew, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 30, 1981, Ser. No. 315,597
Int. Cl.³ B32B 17/00
U.S. Cl. 428—410 7 Claims



1. A process for forming a uniform, adherent, polycrystalline layer of cristobalite on the surface of a vitreous silica substrate comprising the steps of:

(a) providing said substrate of vitreous silica; and

(b) exposing said surface of said substrate to a gas phase reactive atmosphere comprising atomic iodine at a predetermined elevated temperature for a predetermined period of time to thereby enable said atomic iodine to react with and remove water and water-derived impurities from the surface layer of said vitreous silica and to subsequently convert said surface layer of said vitreous silica to crystalline β-cristobalite having a melting point in excess of 1800° C.

6. An article of manufacture comprising a body of vitreous silica having a uniform, adherent layer of polycrystalline cristobalite of predetermined thickness formed on the surface of said body of said vitreous silica, characterized in that said cristobalite has a melting point in excess of 1800° C.

4,429,010

HIGH DENSITY MAGNETIC RECORDING MEDIUM

Fujio Shibata, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

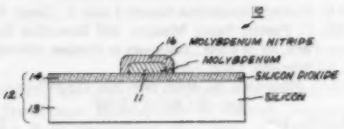
Filed Mar. 24, 1982, Ser. No. 361,244
Claims priority, application Japan, Apr. 27, 1981, 56-62556
Int. Cl.³ G11B 5/68
U.S. Cl. 428—425.9 3 Claims

1. A magnetic recording medium comprising a coating of ferromagnetic particles and a binder on a non-magnetic substrate; wherein said binder consists of a copolymer and a polyurethane elastomer, wherein said copolymer consists of 80–89% of vinyl chloride, 5–10% of vinyl acetate and 6–10% of vinyl alcohol, by weight.

4,429,011
COMPOSITE CONDUCTIVE STRUCTURES AND METHOD OF MAKING SAME

Manjin J. Kim, and Tat-Sing P. Chow, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,682
Int. Cl.³ B05D 5/12; H01L 21/306
U.S. Cl. 428—450 24 Claims

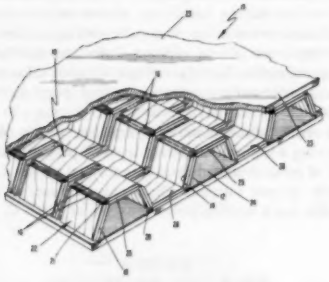


17. In combination,
a substrate,
a patterened conductive layer of molybdenum overlying said substrate, said conductor being formed by sputtering molybdenum on said substrate,
a layer of molybdenum nitride overlying the exposed surfaces of said conductor, said layer of molybdenum nitride being formed by heating said conductor in an atmosphere including ammonia at a temperature in the range from about 400° C. to 850° C. for a time to cause said atmosphere to react with said conductor to form said layer of molybdenum nitride.

4,429,012
LAMINATED WOOD PRODUCTS

Peter Danko, 917 King St., Alexandria, Va. 22314

Filed Jul. 20, 1981, Ser. No. 284,683
Int. Cl.³ B32B 3/12, 3/26, 23/10
U.S. Cl. 428—12 20 Claims

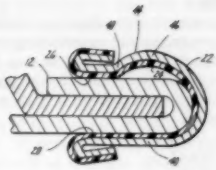


1. A layered sheet-like product comprising:
(a) two sheets of wood;
(b) a pliable material between said sheets, said pliable material having a form such that said two sheets may be adhered, one to the other, with said pliable material therebetween;
(c) means for adhering said sheets together with said pliable material therebetween;
(d) said wood sheets being compressed around said pliable material to form a unitary product; and
(e) grooves on at least one side of said product at predetermined locations to facilitate bending said product along said grooves, each of the grooves penetrating only through the sheet on one side of the pliable material.

4,429,013
EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed May 27, 1983, Ser. No. 498,739
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ B60R 13/04
U.S. Cl. 428—122 15 Claims

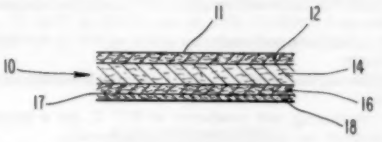


1. In an edge guard of the type comprising a metal strip formed into a generally U-shaped transverse cross section having inner and outer legs and beads at the distal ends of the legs via which the edge guard is self-retained on the edge of an object when installed thereon, the improvement wherein the U-shaped cross section has a generally semi-circular contoured base and includes an inward offset joining one end of the base with the corresponding bead on one leg so that such bead is disposed in inwardly offset relation to the corresponding end of the generally semi-circularly contoured base, and wherein the cross section has the other leg comprising a straight segment extending straight from the other end of the generally semi-circularly contoured base to the corresponding bead.

4,429,014
LAMINATED WIPER

William G. Isner, Media, Pa., and John C. Smoyer, Wilmington, Del., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 16, 1982, Ser. No. 399,144
Int. Cl.³ B32B 3/28
U.S. Cl. 428—152 27 Claims



1. A multi-layered wiper comprising:
(a) a strong surface region of fibers having a predominate length of less than one-fourth inch and having bonding material disposed therein in a fine spaced apart pattern, the areas in the strong surface region where the bonding material is disposed being finely creped;
(b) an inner core region of fibers having a predominate length of less than one-fourth inch and generally having less fiber concentration than the surface region;
(c) a second strong region of fibers having a predominate length of less than one-fourth inch and having a greater fiber concentration than in the inner core region and having bonding material disposed therein in a fine spaced apart pattern to bond the fibers in the second strong region together into a strong network, the bonding material in the second strong region being substantially unconnected to the bonding material in the strong surface region and many of the fibers in the inner core region adjacent to the first strong surface region and the second strong region being tied into fibers in the first strong surface region

or second strong region by either papermaking bonds or bonding material; and

(d) a strengthening layer comprising a web of fibrous material having a minimum wet tensile strength of about 16 ounces per inch measured in any direction, and being substantially free of apertures larger than 0.02 square inches, said strengthening layer being bonded to the exterior surface of the second strong region.

4,429,015

MULTI-PLY LAMINAE AND IDENTIFICATION CARD

Nicholas Sheptak, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 139,656, Apr. 14, 1980, Pat. No. 4,343,851. This application Apr. 1, 1982, Ser. No. 364,395

Int. Cl.³ B23B *7/02, 27/16*

U.S. Cl. 428—201 **14 Claims**

1. An identification card consisting essentially of a core layer comprising an information bearing substrate having bonded to at least the top surface thereof a multi-ply lamination comprising (a) an outer protective layer of a thermoplastic material, capable of providing clarity, chemical and high temperature resistance and rigidity to the laminar structure; (b) at least one layer of a uniaxially oriented polymer material having a with-grain to cross-grain tensile strength ratio greater than about 4 to 1 and a maximum elongation in both with-grain and cross-grain directions of less than 150% selected from the group consisting of high density polyethylene, polypropylene, polyacrylonitrile, acrylonitrile-butadiene-styrene terpolymer and polyvinylchloride; (c) at least one heat sealant or bonding material effective to bond said uniaxially oriented polymer film layer to said outer protective layer; and (d) at least one sealant or bonding material effective to bond said uniaxially oriented film layer to said core layer comprising an information-bearing substrate, said oriented film layer being heat set after uniaxial orientation whereby said uniaxially oriented polymer film layer provides a tell-tale indication of tampering and results in defibrillation upon attempted delamination of the card structure.

4,429,016

MAGNETIC RECORDING MEDIUM WITH VACUUM DEPOSITED MAGNETIC LAYER

Ryuji Sugita, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

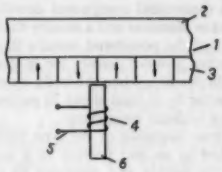
Filed Mar. 4, 1981, Ser. No. 240,368

Claims priority, application Japan, Mar. 7, 1980, 55-29622; Mar. 10, 1980, 55-30615; Oct. 16, 1980, 55-145166; Nov. 11, 1980, 55-159290

Int. Cl.³ G11B *5/66*

U.S. Cl. 428—692 **3 Claims**

1. A magnetic recording medium comprising a magnetic layer containing Co and Cr as the main components thereof, formed on a substrate by vacuum deposition, the magnetic layer having an axis of easy magnetization perpendicular to the surface of the medium, wherein said magnetic layer contains Cr in an amount of 13 to 28% by weight based on the total of Co and Cr and has a saturation magnetization larger than that of the bulk having the same composition as the average composition thereof and wherein a packing coefficient x, defined by the quotient obtained by dividing the density of said magnetic film (g/cm³) by the density of a single crystal having the same composition as that of said magnetic film (g/cm³) is between 0.75 and 0.95.



4,429,017

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 6, 1982, Ser. No. 447,364

Claims priority, application Japan, Dec. 7, 1981, 56-196677

Int. Cl.³ G11B *5/70;* **B32B** *27/30*

U.S. Cl. 428—463 **8 Claims**

1. A magnetic recording medium comprising a non-magnetic support base having thereon a magnetic recording layer having a ferromagnetic powder dispersed in a binder, the binder being comprised of a copolymer of vinyl chloride/vinylidene chloride/vinyl alcohol in a ratio of 20 to 89 wt% of vinyl chloride: 10 to 60 wt% of vinylidene chloride: 1 to 20 wt% of vinyl alcohol.

4,429,018

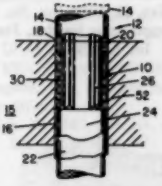
HOSE COUPLING FERRULE AND PROCESS

Robert E. Stuemky, Elizabeth, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Jun. 8, 1981, Ser. No. 271,293

Int. Cl.³ B22F *5/00*

U.S. Cl. 428—546 **14 Claims**



1. A method for making a ferrule having a crushable sleeve-type body that is reducible in diameter and with a fitting end, hose end, and sidewall defining inner and outer surfaces, comprising the steps of:

placing a quantity of metal powder in a punch type mold cavity;

pressing the powder and forming the sleeve-type body;

compressing the sleeve-type body and forming a green, ferrule briquette; and

sintering the ferrule briquette to a density that is at least about 80 percent of the powdered metal's theoretical 100 percent compacted powder density to define a finished ferrule that when crushed and deformed without resintering as by swaging or crimping, and reduced in diameter by at least about 20 percent, has a density that is at least about 86.3 percent of the powdered metal's theoretical 100 percent compacted powder density but is less than the powdered metal's wrought density.

6. A crimpable hose ferrule comprising:

a sleeve-type body that is reducible in diameter and formed of sintered powdered metal characterized by having a density that is at least about 80 percent of the powdered metal's theoretical compacted density before the body is reduced in diameter and a density that is at least about 86.3 percent of the powdered metal's theoretical 100 percent compacted powder density but is less than the powdered wrought density, when the body is deformed and reduced in diameter by at least about 20 percent as by crimping or swaging without resintering.

12. In a hose assembly of the type with a ferrule and male stem attached to an end portion of a hose by crushing and deforming the ferrule and reducing its diameter by at least about 20 percent as by swaging or crimping, the improvement comprising:

the ferrule having a sleeve-type body formed of sintered powdered metal having a density that is at least about 80 percent of the powdered metal's theoretical 100 percent compacted density before the ferrule is crushed and reduced in diameter, and a density of at least about 86.3 percent of the powdered metal's theoretical 100 percent compacted density but is less than the powdered metal's wrought density after the ferrule is crushed, reduced in diameter, and attached to the hose without resintering.

14. A method for increasing the density of a ferrule to a level suitable for use in attaching the ferrule and a male stem to an end portion of a hose comprising:

forming a ferrule with a sleeve-type body of sintered powdered metal having a density that is at least about 80 percent of the powdered metal's theoretical 100 percent compacted powder density; and

crushing and deforming the ferrule and reducing its diameter by at least about 20 percent as by crimping or swaging while simultaneously increasing the density of the body to at least about 86.3 percent of the powdered metal's theoretical 100 percent compacted powder density, but less than the powdered metal's wrought density, without resintering.

4,429,019

HEAT-RESISTANT MACHINE COMPONENT

Nils G. Schrewelius, deceased, late of Hallstahammar, Sweden (by Maud Schrewelius, legal representative), assignor to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed Jan. 21, 1981, Ser. No. 226,992
Claims priority, application Sweden, Jan. 3, 1980, 8000750
Int. Cl.³ B32B *15/02*
U.S. Cl. 428—550 **12 Claims**

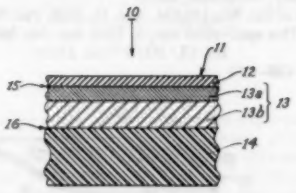
1. A heat resistant machine component for use in a hot-gas atmosphere under dynamic mechanical strain which comprises a core body of heat resistant material and a composite surface layer sprayed thereon wherein said surface layer has a porosity of up to 8% by volume and comprises a Fe-Cr-Al alloy component consisting essentially of 1–12% Al, 10–30% Cr, small quantities of at least one element selected from the group of Si, Mn, Co, Y, Hf, or mixtures thereof, and the balance being substantially Fe; and a minor quantity of an oxide component containing Al_2O_3; wherein the pores and the oxide component form elongated, narrow regions which partly surround or cover said alloy component and wherein the narrow regions are wave-like and extend in a main direction substantially parallel to the surface of the surface layer and wherein the thickness of said narrow regions is up to 2 μm.

4,429,020

METAL-POLYMER COMPOSITE AND METHOD OF MAKING SAID COMPOSITE

Daniel Luch, 6 Fairview Ave., Warwick, N.Y. 10990

Continuation-in-part of Ser. No. 152,344, May 22, 1980, abandoned. This application Jul. 1, 1981, Ser. No. 279,255
Int. Cl.³ C25D *5/10, 5/56*
U.S. Cl. 428—625 **11 Claims**



1. In a process of preparing a silvery hued article for use where long term durability against thermal shock and thermal cycling is required, the improvement comprising providing a body of solid material having a directly electroplateable polymer at an exterior surface, electrodepositing metal consisting of essentially pure nickel durably adherent onto the plateable polymer, and subsequently depositing a durable tin-based alloy composed essentially of tin and metal from the group nickel, cobalt and mixtures thereof joined to the electrodeposited metal adhering to the directly electroplateable polymer at the body with durability characterized by capability for satisfactorily surviving, without blistering or cracking deterioration, the HSTS and TC thermally accelerated evaluation programs.

6. A metal-polymer composite article for use where long term durability against thermal shock and thermal cycling is required comprising: a body component containing a directly electroplateable polymeric material; an exterior stratum of a durable tin-based alloy composed essentially of tin and metal from the group nickel, cobalt and mixtures thereof; and an electrodeposited interior metal stratum consisting of essentially pure nickel disposed between and durably joined to the body and the exterior stratum and adhering to directly electroplateable polymeric material in the body, said article being characterized by having the aforesaid body and strata joined together with durable adherency sufficient for satisfactorily surviving, without blistering or cracking deterioration, the HSTS and TC thermally accelerated evaluation programs.

4,429,021

CHROMIUM-PLATED STEEL STRIP HAVING EXCELLENT WELDABILITY AND RESISTANCE TO CORROSION

Mitsuo Higashi; Jyun-ichi Morita; Kenzi Koyama, all of Chita, and Mitsuo Yoshida, Tokai, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Dec. 8, 1981, Ser. No. 328,699
Claims priority, application Japan, Dec. 29, 1980, 55-187719
Int. Cl.³ B32B *15/04, 15/18*
U.S. Cl. 428—629 **5 Claims**

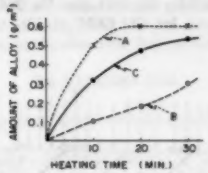
1. A chromium-plated steel strip having excellent weldability and resistance to corrosion, comprising:

a steel strip substrate;

an amorphous metal base layer consisting essentially of Ni-P or Ni-B formed on said substrate in an amount of 3 to 500 mg per m^2 of said substrate;

with P or B in an amount of 1-21 mg/m^2 of said substrate;

an electroplated tin intermediate layer formed on said base layer in an aqueous bath in an amount of 2.8 g or less per m^2 of said substrate, and;



a surface layer coated on said intermediate layer, said surface layer containing 5 to 150 mg of metallic chromium and 3 to 30 mg of hydrated chromium oxide per m^2 of said substrate.

4,429,022

COMPOSITE MATERIAL HAVING IMPROVED BOND STRENGTH

John F. Breedis, Trumbull, and Julius C. Fister, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 28, 1982, Ser. No. 392,999
Int. Cl.^{3} B32B *15/20*
U.S. Cl. 428—675 **11 Claims**

1. A composite material having improved bond strength and a substantially smooth external surface, said composite material comprising:

a core comprising a deoxidized copper base alloy consisting essentially of at least 95% copper and from about 0.05% to about 0.5% zirconium;

a cladding comprising a dissimilar copper alloy; and

a strong metallurgical bond between said core and cladding, said bond being formed by rolling together said core and cladding in a single pass with a reduction of about 50% to 75% and by heating said bonded core and cladding at a temperature in the range of about 200° C. to about 750° C. for a time period of about 5 minutes to 24 hours to increase the strength of said bond.

9. A composite having improved bond strength, said composite comprising:

a core comprising a deoxidized copper base alloy consisting essentially of at least 95% copper and from about 0.05% to about 0.5% zirconium; and

a dissimilar copper alloy cladding the composite having a bond strength of at least about 200 pounds per $\frac{3}{4}$ inch width to being substantially unpeelable.

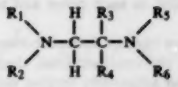
4,429,023

MAGNETIC RECORDING MEDIUM

Dieter Frank, Naperville, and Lincoln D. Metcalfe, Lagrange, both of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 228,524, Jan. 26, 1981, Pat. No. 4,334,887, which is a continuation of Ser. No. 118,270, Feb. 5, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,308
Int. Cl.^{3} H01F *10/02*
U.S. Cl. 428—694 **3 Claims**

1. A magnetic recording medium comprising a non-magnetic carrier and a magnetizable coating provided on said carrier, said magnetizable coating comprising a binder and magnetic pigments finely dispersed therein by means of a dispersing agent, said dispersing agent being a compound of the formula:



wherein R_1 is selected from the group consisting of alkyl and alkenyl groups containing from 4 to 22 carbon atoms, aryl groups containing from 4 to 10 carbon atoms, alkyl and alkenyl groups containing from 4 to 10 carbon atoms, alkyl and alkenyl groups containing from 4 to 22 carbon atoms substituted with one or more aryl groups containing from 4 to 10 carbon atoms and aryl groups containing from 4 to 10 carbon atoms substituted with one or more alkyl or alkenyl groups containing from 1 to 22 carbon atoms; R_2 is selected from the group consisting of hydrogen, $-(CH_2CH_2O)_nH$, wherein n is an integer from 1 to 10, alkyl and alkenyl groups containing from 1 to 22 carbon atoms, aryl groups containing from 4 to 10 carbon atoms, alkyl and alkenyl groups containing from 1 to 22 carbon atoms substituted with one or more aryl groups containing from 4 to 10 carbon atoms and aryl groups containing from 4 to 10 carbon atoms substituted with one or more alkyl or alkenyl groups containing from 1 to 22 carbon atoms; R_3 and R_4 are independently selected from the group consisting of hydrogen, $-CH_3$, and $-CH_2CH_3$; and R_5 and R_6 are independently selected from the group consisting of hydrogen, $-CH_3$, $-CH_2CH_3$, and $-(CH_2CH_2O)_nH$ wherein n is an integer from 1 to 10.

4,429,024

METHOD OF MAKING ANTISTATIC MAGNETIC RECORDING TAPES AND RECORDING TAPES

Susumu Ueno; Hirokazu Nomura, both of Ibaraki, and Kiyoshi Imada, Omiya, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1982, Ser. No. 406,058
Claims priority, application Japan, Aug. 14, 1981, 56-127467
Int. Cl.^{3} B05D *3/06*
U.S. Cl. 428—694 **7 Claims**

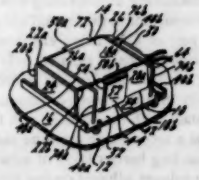
1. An antistatic magnetic recording tape which comprises a film base made of a synthetic plastic resin, a layer of a plasma-polymerized gaseous compound provided on at least one surface of the film base and a magnetic layer provided on at least one surface of the film base.

4,429,025

BATTERY RETAINING DEVICE

Mark Stow, Indianapolis, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.

Filed Sep. 30, 1982, Ser. No. 429,531
Int. Cl.^{3} H01M *2/10*
U.S. Cl. 429—97 **16 Claims**



1. A battery retaining device for removable mechanical interconnection of a battery having a longitudinal axis with a housing of an electrical apparatus requiring said battery for operation, said retaining device comprising:

a bracket adapted to be attached to the housing;

a pair of stanchions fixedly interconnected with said bracket,

each stanchion extending outwardly from said bracket generally parallel to each other and terminating in free ends,

a battery retention channel formed between said stanchions approximating the cross-sectional shape of a portion of said battery and adapted to receive said battery wherein with its longitudinal axis lying between said stanchions;

a clamp support element pivotally fastened to said bracket near one of said stanchions such that said element is pivoted about an axis parallel to said longitudinal axis towards and away from the other of said stanchions;

clamp engaging means near said free end of said other stanchion;

a clamp interconnected with said clamp support element such that, when said element is pivoted fully towards said other stanchion, said clamp is near said clamp engaging means and

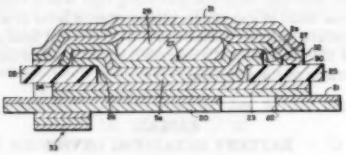
elastic spring means between clamp and said clamp support element whereby said clamp may be removably interconnected with said clamp engaging means by temporary elastic deflection of said spring means and whereby said spring means biases said other stanchion towards said battery.

4,429,026

LAMINAR MULTICELL LITHIUM BATTERIES

Alan H. Bruder, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 20, 1982, Ser. No. 341,196
Int. Cl.³ H01M 6/46
U.S. Cl. 429—152 **7 Claims**



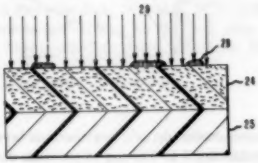
1. A laminar multicell lithium battery, comprising, in combination, a plurality of stacked contiguous laminar cells; each cell comprising a lithium anode, a cathode comprising a slurry dispersion of active cathode particles in an organic solution of a lithium salt containing a passivating solvent, and an electrolyte permeable separator between said anode and said cathode; each adjacent pair of cells being electronically connected in series and electrochemically isolated only by a laminar intercell connector; each of said laminar intercell connectors consisting essentially of a first layer of conductive plastic having one side in contact with the cathode of a first of said adjacent pair of cells and a second side opposite said first side, an electronically conducting barrier layer of material impermeable to said passivating solvent adhered on one side to said second side of said first layer of conductive plastic and having a second side, said barrier layer being in registry with said cathode and being at least coextensive with the area of said cathode in contact with said first layer to substantially prevent passage of said passivating solvent, and a second layer of conductive plastic adhered to said second side of said barrier layer on one side and having an opposite side in contact with the anode of the other of said adjacent pair of cells.

4,429,027

PHOTOIMAGING PROCESS

Vaughan C. Chambers, Jr., Wilmington, Del., and Joseph E. Gervay, Red Bank, N.J., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 21, 1981, Ser. No. 266,057
Int. Cl.³ G03C 11/12
U.S. Cl. 430—5 **5 Claims**



1. A process for photoimaging a photosensitive layer comprising the steps:

(a) forming in situ an actinic radiation-opaque image on a transparent cover sheet which is on the photosensitive layer;

(b) exposing the image-bearing layer to actinic radiation by which the layer is photoimaged;

(c) removing the cover sheet; and

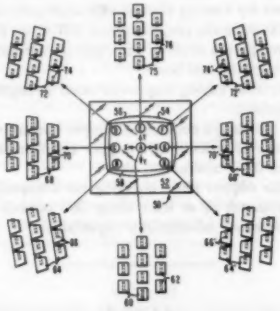
(d) developing or fixing the photoimage.

4,429,028

COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK AND METHOD OF MAKING SAME

Henry W. Kuzminski, Ephrata, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 22, 1982, Ser. No. 390,870
Int. Cl.³ G03C 5/00
U.S. Cl. 430—5 **4 Claims**



1. In a method of fabricating a slit-type shadow mask for a color picture tube, wherein the method includes coating both sides of a metal sheet with a photosensitive material, photoexposing the photosensitive material on both sides of the metal sheet through two aligned photographic masters having aperture patterns thereon, said aperture patterns including major and minor axes, developing the photosensitive material and etching apertures in said metal sheet, the improvement comprising the aperture pattern on a first of said photographic plates including trapezoidal-shaped elements at locations away from the vicinity of the pattern minor axis, with the longer bases of the trapezoidal-shaped elements facing away from the minor axis.

4,429,029

ORGANIC ELECTROPHOTOGRAPHIC RECORDING MEDIUM

Gerhard Hoffmann, Otterstadt; Fritz Graser, and Reinhold J. Leyrer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,581

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110960

Int. Cl.³ G03G 5/06

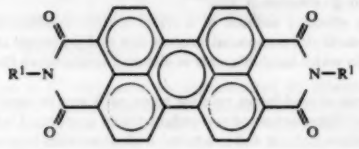
U.S. Cl. 430—57 5 Claims

1. An electrophotographic recording medium which consists essential of

(a) an electrically conductive base,

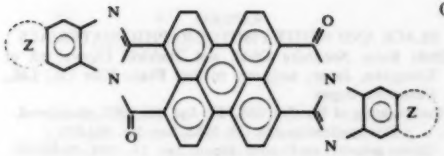
(b) a first layer containing a charge carrier-producing dye of the formula (I) or (II)

(I)



(chlorine)$_n$

(II)



(chlorine)$_m$

where R^1 is hydrogen, alkyl, aralkyl, aryl or alkylaryl, and Z, where relevant, is a fused aromatic system, and

(c) a second layer which is substantially transparent to actinic light and is compsed of insulating organic materials containing at least one compound which is charge carrier-transporting when exposed to light, wherein the chlorine substitution n or m, based on the aromatic skeleton of the formula (I) or (II), is from 45 to 75% of the maximum possible.

4,429,030

PHOTOCONDUCTIVE COMPOSITIONS

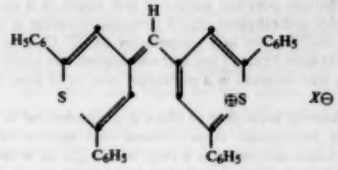
Jerome H. Perlstein; George A. Reynolds; James A. VanAllan, and Suzanne P. Clark, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 874,971, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 855,141, Nov. 28, 1977, abandoned. This application Oct. 20, 1982, Ser. No. 435,524

Int. Cl.³ G03G 5/06, 5/14

U.S. Cl. 430—75 13 Claims

1. A photoconductive composition having both high speed and high resolution, wherein the composition comprises a film forming electrically insulating polymer and a dye in the form of a dye-dye complex, having a structure according to the formula



wherein X⊖ represents an anion; the dye has an absorption spectrum which changes when a binderless coating of the dye is treated with solvent vapors, and the composition containing the dye-dye complex has an absorption spectrum which is similar to the changed absorption spectrum of the dye when treated with solvent vapors.

4,429,031

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT

Motohiko Tsubota; Masakazu Morigaki; Tsutomu Hamaoka, and Nobutaka Ohki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1980, Ser. No. 193,495

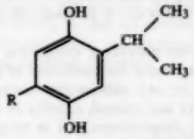
Claims priority, application Japan, Oct. 3, 1979, 54-127567

Int. Cl.³ G03C 5/54

U.S. Cl. 430—218 8 Claims

1. A color diffusion transfer photographic element comprising (a) a photosensitive component containing at least one photosensitive silver halide emulsion layer combined with a DRR compound, (b) a dye image receiving component and (c) an alkaline processing composition component, wherein the improvement comprises at least one of said components (a), (b), and (c) containing a compound represented by the formula (I)

(I)



wherein R represents a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms.

4,429,032

SURFACE-TREATED VINYL CHLORIDE POLYMER MATERIAL INCLUDING AN ADHERING HYDROPHILIC LAYER

Herman L. Matthe, Zoersel; Lucien J. Van Gossum, Kontich, and Ludovicus M. Mertens, Halle, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 10, 1982, Ser. No. 376,641

Claims priority, application United Kingdom, May 18, 1981, 8115170

Int. Cl.³ G03C 5/54, 1/48, 1/78, 1/96

U.S. Cl. 430—231 11 Claims

1. A material comprising a vinyl chloride polymer layer free of hydrophilic monomeric units and an adhering hydrophilic layer, wherein the adhesivity of the surface of the vinyl chloride polymer layer to said adhering layer has been improved by a treatment with a corona discharge of the uncoated vinyl chloride polymer layer surface, characterized in that said adhering layer comprises a mixture of a hydrophilic colloid binder and dispersed colloidal silica in a weight ratio of from 5/1 to 1/2, and also that said treatment of the uncoated vinyl chloride polymer layer surface with said corona discharge is sufficient to impart a degree of wettability determined by a

wetting test which comprises applying to the treated uncoated vinyl chloride polymer surface a test liquid of a mixture of formamide and ethylene glycol monomethyl ether in a ratio of at least 90.7:9.3 v/v at a temperature of 20° C. over an area thereof at least 3 cm×3 cm, and said applied test liquid mixture retracts into droplets in a retraction time of at least two seconds.

11. Material according to claim 1, characterized in that the adhering hydrophilic layer contains said mixture of hydrophilic colloid and silica in a ratio by weight of at least 80% with respect to the total weight of said layer.

4,429,033

PROCESS FOR THE PRODUCTION OF COLOR PRINTS BY THE DYE-DIFFUSION TRANSFER PROCESS

Immo Boie, Langenfeld; Manfred Peters, Leverkusen, and Thomas Kaluschke, Leichlingen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,623

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119929

Int. Cl.³ G03C 7/00, 1/40, 1/10, 5/54

U.S. Cl. 430—237 5 Claims

1. A process for the production in the dye diffusion process of a color print visible through a transparent layer support, in which a color photographic recording material comprising

a transparent layer support,

a photosensitive element comprising at least one photosensitive silver halide emulsion layer and a non-diffusing color-providing compound associated therewith,

a light-reflecting opaque layer and

a mordant layer,

is exposed imagewise and developed wherein the improvement comprises a novel combination of improvements of said dye diffusion process of

(1) the transparent layer support, the photosensitive element, the light-reflecting opaque layer and the mordant layer being formed in that order in an inseparable layer assembly;

(2) the non-diffusing color-providing compound being first, capable of forming under the conditions of photographic development or any subsequent treatment a non-diffusing image dye and second, capable of releasing in consequence of development and in imagewise distribution a diffusible anionic compound, thereby losing its ability to form an image dye;

(3) the recording material being subjected to imagewise exposure through said transparent layer support;

(4) the exposed recording material being treated with an alkaline developer solution or paste to form each of the following in the photosensitive element:

a silver image;

a positive retained image consisting of an imagewise distribution of the non-diffusing color-providing compound or of an image dye formed therefrom under the development conditions and, complementarily thereto an imagewise distribution of the diffusible anionic compound released from the non-diffusing color-providing compound, the latter being transferred by diffusion, under the conditions of photographic development, to the mordant layer and fixed thereon;

(5) said silver image and the undeveloped silver halide are removed by bleaching and fixing; and

(6) when said positive retained image forming non-diffusing color-providing compound after development, bleaching and fixing does not have the color of the required positive dye image the recording material is additionally subjected to another treatment to convert the non-diffusing color-providing compound present in imagewise distribution in the photosensitive element into an image dye.

4,429,034

DRY FILM RESISTS

John J. Keane, Ballston Lake, and Richard F. Zopf, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 190,029, Sep. 23, 1980, Pat. No. 4,341,859. This application Apr. 12, 1982, Ser. No. 367,678

Int. Cl.³ G03C 1/68

U.S. Cl. 430—271 6 Claims

1. A water-dispersible flexible apparently dry but tacky photoresist film comprising a homogeneous mixture of:

(i) colloidal droplets of a solution in a solvent comprising acetone, methyl chloride, methylformate or propylene carbonate of a polyaryliodonium or sulfonium salt of a complex halogenide latent catalyst dispersed in a continuous aqueous phase containing,

(ii) a water-soluble normally solid polyvinyl alcohol as film-forming component, and

(iii) an effective amount of a water-soluble thermosetting polymethylol compound to cross-link said polyvinyl alcohol to water-insoluble state at elevated temperature therefor,

the amount of said latent catalyst being sufficient to catalyze the cross-linking action of said polymethylol compound when said emulsion is dried and irradiated with ultraviolet light and heated simultaneously with or subsequent to said irradiation.

4,429,035

BLACK AND WHITE PHOTOGRAPHIC MATERIALS

Eiichi Kato; Nobutaka Ohki, and Junkichi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

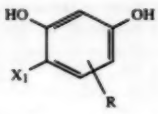
Continuation of Ser. No. 368,927, Apr. 16, 1982, abandoned. This application Jun. 20, 1983, Ser. No. 504,855

Claims priority, application Japan, Apr. 17, 1981, 56-58069

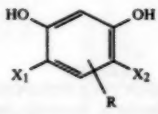
Int. Cl.³ G03C 7/16

U.S. Cl. 430—402 18 Claims

1. A process for forming black and white images which comprises color developing with an aromatic primary amine a black and white photographic material comprising a support having formed thereon a silver halide photographic emulsion layer containing a black image-forming coupler represented by general formula (I) or (II):

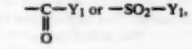


(I)



(II)

wherein R represents



wherein Y_1 represents an aliphatic group, an aryl group, an aralkyl group, or a heterocyclic group, said group preventing said coupler from diffusing from the emulsion layer containing it and X_1 and X_2 each represents a hydrogen atom or a coupling-off group capable of being released upon oxidative coupling reaction with a developing agent.

4,429,036

METHOD OF FORMING A PHOTOGRAPHIC IMAGE

Shigeo Hirano, and Yoshihiro Takagi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 345,501, Feb. 3, 1982. This application Mar. 31, 1983, Ser. No. 480,650

Claims priority, application Japan, Feb. 3, 1981, 56-14564; Feb. 3, 1981, 56-14565; Feb. 3, 1981, 56-14567

Int. Cl.[3] G03C 5/24; G03F 7/06

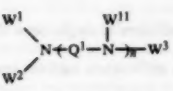
U.S. Cl. 430—405 18 Claims

1. A method of forming a photographic image which comprises development processing with an alkaline aqueous activator solution an imagewised exposed silver halide photographic light-sensitive material comprising a support having thereon at least one surface latent image type silver halide emulsion layer, and containing in at least one layer selected from a silver halide emulsion layer and another hydrophilic colloid layer (1) a hydroquinone series developing agent and (2) an acylhydrazine compound represented by formula (I):

$$R^1NHNHCOR^2 \quad (I)$$

wherein R^1 represents an unsubstituted or substituted aryl group or alkyl group; and R^2 represents a hydrogen atom, or an unsubstituted or substituted aryl group or alkyl group,

wherein the aqueous activator solution or a prebath thereof contains at least one compound represented by formula (II):



(II)

wherein each of W^1, W^2, W^3 and W^{11} can represent a hydrogen atom, an unsubstituted or substituted alkyl group, alkenyl group, or alkynyl group, an acyl group, or a sulfonyl group, and W^1 and W^2, or W^3 and W^{11}, can be bonded to each other to form a ring; Q^1 represents $—CH_2CH_2—$ or $—CH_2CH_2CH_2—$; and n represents an integer of 1 to 4.

4,429,037

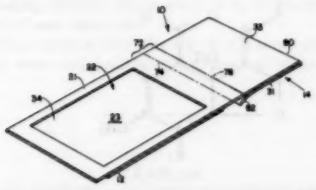
SELF-PROCESSING FILM UNIT WITH LIQUID APPLICATOR

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 30, 1982, Ser. No. 445,417

Int. Cl.[3] G03C 5/54, 1/48, 1/40; G03D 9/00

U.S. Cl. 430—499 24 Claims



1. A self-processing film unit comprising:

a sheet-like film component including one or more photosensitive layers and having an outer surface with a given area thereof that is configured to be wetted with a low viscosity processing liquid, following exposure of said one or more photosensitive layers, to initiate processing of said film component; and

a liquid applicator secured to said film component, said applicator including an initially folded and releasably sealed enclosure section having therein means yieldably holding a substantially uniformly distributed supply of a low viscosity processing liquid, a leader section, and a ground section, said enclosure section including a portion of a sheet folded back on itself to define opposite facing enclosure wall sections which are releasably sealed together along three open edge portions thereof to form an enclosure about said liquid holding means, said leader section being coupled to one of said wall sections and said ground section being coupled to the other of said wall sections so that, in response to the application of a force to said leader section and then to following portions of said film unit, said ground section mechanically grounds a portion of said enclosure section and thereby provides a reaction force which cooperates with said applied force to effect the unsealing of said enclosure section in conjunction with its movement to an extended position overlying said film component outer surface to locate said liquid holding means in liquid yielding contact with said given area to effect wetting thereof.

4,429,038

PROCESS FOR CONCENTRATING YELLOW SILVER SOLS

Franz Moll, and Ingeborg Höll, both of Leverkusen, Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,653

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130345

Int. Cl.[3] G03C 1/84, 1/05

U.S. Cl. 430—510 4 Claims

1. A process for the production of a yellow silver sol prepared by reducing a water-soluble silver salt and precipitating the sol preparation and in the presence of a binder flocculating, washing and redispersing the preparation,

wherein the improvement comprises in the presence of calcium-free gelatin flocculating and redispersing the sol, and adding to said sol preparation a water-soluble chloride selected from the group consisting of ammonium and alkali metal chlorides.

4,429,039

PHOTOGRAPHIC ELEMENT

Takeji Ochiai, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 671,928, Mar. 30, 1976, abandoned. This application May 17, 1982, Ser. No. 378,710

Claims priority, application Japan, Mar. 31, 1975, 50-39528

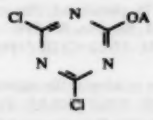
Int. Cl.[3] G03C 1/74, 1/80, 1/30

U.S. Cl. 430—534 9 Claims

1. A silver halide photographic light-sensitive material comprising a support having thereon a subbing layer and at least one light-sensitive silver halide emulsion layer over said subbing layer, wherein said subbing layer consists essentially of

(1) at least one copolymer of about 10 to about 90% by weight of at least one diolefin monomer and about 90 to about 10% by weight of at least one vinyl monomer, and

(2) at least one dichloro-s-triazine derivative represented by the following general formula



[I]

wherein A represents a metal atom.

4,429,040

METHOD AND REAGENT FOR THE DETECTION OF FIBRIN MONOMER

Udo Becker, Munich, and Peter Roeschlau, Seeshaupt, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Del.X

Filed Apr. 21, 1981, Ser. No. 256,212

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017707

Int. Cl.³ G01N *33/54*; C12Q *1/56*

U.S. Cl. 435—7 **8 Claims**

1. Method for the determination of fibrin monomer in a biological fluid sample comprising incubating said fluid sample with a reagent consisting essentially of hydrophobic latex under conditions suitable for agglutination, and determining the resulting agglutination as a measure of fibrin monomer content in the sample.

4,429,041

PROCESS OF PRODUCING 9-HYDROXY-3-OXO-4,17(20)-PREGNADIENE-20-CARBOXYLIC ACID

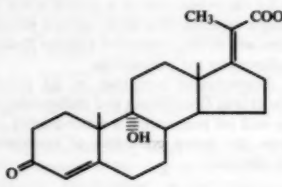
Merle G. Wovcha; John C. Knight, and Alfred B. Garcia, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 11, 1981, Ser. No. 262,018

Int. Cl.³ C12N *1/20*

U.S. Cl. 435—58 **5 Claims**

1. A one-stage fermentation process for preparing a compound of the formula



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which comprises cultivating *Mycobacterium fortuitum* NRRL B-12433 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid with a C-17 side chain and recovering the desired product.

5. A biologically pure culture of mutant *Mycobacterium fortuitum* NRRL B-12433.

4,429,042

STRAIN OF STREPTOMYCES FOR PRODUCING ANTIPARASITIC COMPOUNDS

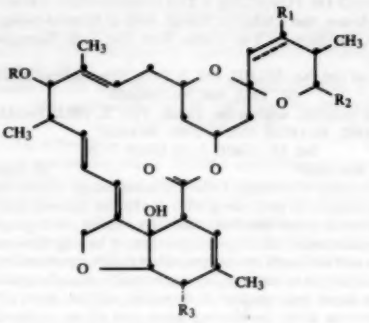
George Albers-Schonberg, Princeton; Hyman Wallick, Springfield; Robert E. Ormond, Edison; Thomas W. Miller, Carteret, and Richard W. Burg, Murray Hill, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 940,682, Sep. 8, 1978, Pat. No. 4,310,519, which is a continuation-in-part of Ser. No. 874,607, Feb. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 772,601, Mar. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 678,328, Apr. 19, 1976, abandoned. This application Dec. 30, 1981, Ser. No. 335,899

Int. Cl.³ C12P *17/18, 17/02*; C12R *1/465*; C12N *1/20*

U.S. Cl. 435—119 **10 Claims**

1. A biologically pure culture of the microorganism *Streptomyces avermitilis* ATCC 31267 (NRRL 8165), said culture being capable of producing the substance C-076 having the formula:



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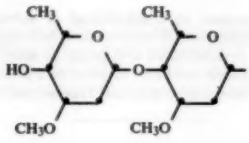
wherein R is:



II

and wherein the broken line indicates a single or a double bond;

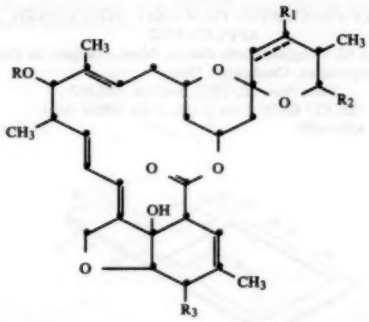
R_1 is hydroxy and is present only when said broken line indicates a single bond;

R_2 is isopropyl or sec-butyl; and

R_3 is methoxy or hydroxy;

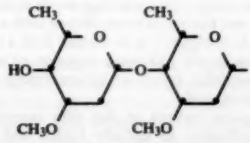
in a recoverable quantity upon fermentation in an aqueous nutrient medium containing an assimilable source of carbon, nitrogen and inorganic salts.

2. A biologically pure culture of the microorganism *Streptomyces avermitilies* ATCC 31272, said culture being capable of producing the substance C-076 having the structural formula:



I

wherein R is:



II

and wherein the broken line indicates a single or a double bond;

R_1 is hydroxy and is present only when said broken line indicates a single bond;

R_2 is isopropyl or sec-butyl; and

R_3 is methoxy or hydroxy;

in a recoverable quantity upon fermentation in an aqueous nutrient medium containing an assimilable source of carbon, nitrogen and inorganic salts.

4,429,043

ANAEROBIC DIGESTION OF ORGANIC WASTE FOR BIOGAS PRODUCTION

Robert Paton, Ponce, P.R., assignor to Biorganic Energy Inc., Hato Rey, P.R.

Filed Jan. 5, 1982, Ser. No. 337,250
Int. Cl.³ C12P *5/02*
U.S. Cl. 435—167 **16 Claims**

1. An anaerobic bacterial process for converting manure containing organic waste material into methane and fertilizer, the combination of steps consisting essentially of:

passing a low solids aqueous suspension of manure containing organic wastes having a solids content of less than about 4% by weight into the first of at least four anaerobic zones, the first and second anaerobic zones being located in one tank and the third and fourth anaerobic zones being located in a second tank, the second zone having a liquid space about one half the liquid space of the first zone, said zones being arranged for liquid communication in series such that addition of liquid to the first zone causes;

liquid flow from the lower portion of the first anaerobic zone to the lower portion of the second anaerobic zone;

liquid flow from the upper portion of the second anaerobic zone to the upper portion of the third anaerobic zone;

liquid flow from the lower portion of the third anaerobic zone to the lower portion of the fourth anaerobic zone;

liquid flow out of the upper portion of the last anaerobic zone;

said serial liquid communication being the only liquid communication between zones, there being no passing of the settled solids from the second anaerobic zone to the third anaerobic zone,

maintaining quiescent conditions in each of said anaerobic zones whereby a three layer stratification of the mixture occurs,

maintaining ambient temperature of up to about 40° C. in each of said zones; and

collecting methane from the top of said zones and periodically removing fertilizer solids from said zones.

4,429,044

PREPARATION OF AN ALKALINE PROTEASE FROM FLAVOBACTERIUM ARBORESCENS

George Boguslawski, and Ernest W. Boyer, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 28, 1982, Ser. No. 425,713
Int. Cl.³ C12N *9/52*; C12R *1/20*
U.S. Cl. 435—220 **8 Claims**

1. A method for the production of microbial alkaline protease which comprises cultivating an organism from the species *Flavobacterium arborescens* in an aqueous nutrient medium containing appropriate nutrients for a time sufficient to produce a recoverable quantity of enzyme.

4,429,045

RABIES VIRUS ADAPTED FOR GROWTH IN SWINE TESTICLE CELL CULTURE

Edmund P. Bass, and Richard L. Sharpee, both of Lincoln, Nebr., assignors to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 174,306, Jul. 30, 1980, Pat. No. 4,347,239.
This application May 10, 1982, Ser. No. 376,908
Int. Cl.³ C12N *7/00, 7/08*
U.S. Cl. 435—235 **2 Claims**

1. HCP-SAD strain of rabies virus, adapted for growth in swine testicle cell culture by at least one passage in said cell culture.

4,429,046

LARGE SCALE CULTIVATION OF *BORDETELLA PERTUSSIS* CELLS FOR VACCINE PRODUCTION

Wenlii Lin, New City, N.Y., and John W. Imbaratto, Hamburg, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 26, 1982, Ser. No. 401,999
Int. Cl.³ C12N *1/20*; A61K *39/02*
U.S. Cl. 435—253 **7 Claims**

1. A process for producing Pertussis Vaccine of high potency and low toxicity which comprises:

(a) producing seed cultures of *Bordetella pertussis* from a biphasic growth in blood agar;

(b) inoculating a biphasic growth system comprising a liquid medium over charcoal agar with said seed system;

(c) inoculating said charcoal biphasic seed into a liquid medium containing an anion exchange resin;

(d) inoculating a deep fermentation tank with liquid medium culture containing an anion exchange resin;

(e) incubating the broth at a temperature of 32°–38° C.;

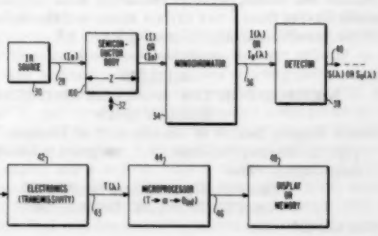
(f) killing the *Bordetella pertussis* and separating the killed bacteria from the broth.

4,429,047

METHOD FOR DETERMINING OXYGEN CONTENT IN SEMICONDUCTOR MATERIAL

Lubomir L. Jastrzebski, Plainsboro, N.J., and Jacek Lagowski, Woburn, Mass., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,176
Int. Cl.³ G01N *21/35*
U.S. Cl. 436—4 **11 Claims**



1. A method for determining all of the oxygen present in a body of essentially monocrystalline semiconductor material capable of containing interstitial oxygen identifiable by a well-defined absorption band, comprising the steps of:

(a) heating the body to a first temperature to initiate the conversion of all of the oxygen present in said body to interstitial form and maintaining said first temperature for a time period sufficient to convert said oxygen to interstitial form;

(b) cooling the heated body both to a second temperature and at a rate of cooling sufficient to maintain all of said oxygen in said interstitial form;

(c) cooling said body still further to a third temperature corresponding to room temperature; and

(d) thereafter measuring at said third temperature the intensity of the absorption band related to the interstitial oxygen of said material of said body to provide an intensity signal representing all of the oxygen contained in said body;

(e) said measuring step comprising the step of exposing said material to a beam of infra-red (IR) energy and measuring the intensity of said absorption band after said exposure step to determine the absorption coefficient (α) related to said interstitial oxygen;

(f) said cooling rate and second temperature being determined by repeating steps (a) through (d) to determine the minimum cooling rate as indicated by no change in the measurement of interstitial oxygen;

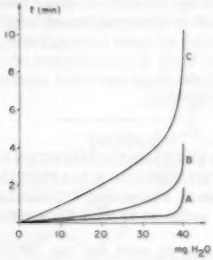
(g) said first temperature and time period being determined by repeating each of steps (a) through (d) until the measurement of interstitial oxygen remains constant.

4,429,048

ALIPHATIC AMINE-CONTAINING KARL FISCHER TITRATION AGENT AND METHOD FOR USING IT

Eugen Scholz, Garbsen, Fed. Rep. of Germany, assignor to Riedel-de Haen Ag., Seelze, Fed. Rep. of Germany

Division of Ser. No. 210,857, Nov. 26, 1980, Pat. No. 4,378,972.
This application Aug. 27, 1982, Ser. No. 412,214
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008421; Oct. 20, 1980, 3039511
Int. Cl.³ G01N *33/18*
U.S. Cl. 436—42 **14 Claims**



1. A titration agent consisting essentially of an amine, sulfur dioxide and iodine, wherein the amine is an acyclic primary amine having from 2 to 6 carbon atoms and the molar ratio of amine to sulfur dioxide is from 0.5:1 to 1.3:1.

4,429,049

METHOD FOR THE ANALYSIS OF ORGANIC POLLUTANTS

Calvin Rogers; Russell A. Parker, both of Durham, N.C., and Terry L. Loucks, Red Bank, N.J., assignors to Mead Corporation, Dayton, Ohio

Filed Feb. 22, 1982, Ser. No. 350,689
Int. Cl.³ G01N *1/00*; B01D *11/04*
U.S. Cl. 436—178 **17 Claims**

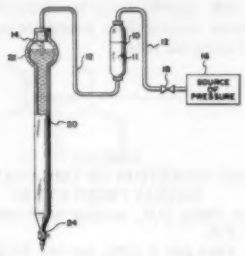
1. A process for the analysis of organic pollutants contained in an aqueous sample comprising the steps of:

(a) placing a predetermined amount of an aqueous sample containing one or more extractable organic pollutants in a column to thereby form a volume of sample;

(b) adjusting the pH of the liquid sample to either an acid, basic, or neutral condition depending upon the organic pollutants to be extracted;

(c) injecting an extraction solvent under pressure into said sample in a single pass to produce a plurality of substantially uniform droplets, said solvent being substantially immiscible with said sample and having a specific gravity greater than said sample, said pollutants being preferentially soluble in said solvent over said sample, the amont of solvent used being in proportion to the amount of said sample contained in the column,

(d) contacting said solvent droplets and said sample for a time sufficient for mass transfer of said pollutants from said sample to said solvent to occur by allowing said solvent droplets to settle through the volume of sample in the column and collect at the bottom thereof,



(e) collecting and removing the resulting extract solution containing one or more of said pollutants,

(f) analyzing at least a portion of the collected pollutant-containing extract solution.

4,429,050

COMPETITIVE IMMUNOCHEMICAL MEASUREMENT OF PLURAL TRACE COMPONENTS INVOLVING SPECTRAL SENSITIZING DYE LABELS

Yukio Yasuda; Nobuhito Masuda; Yuji Mihara; Masaki Okazaki, all of Minami-ashigara, and Nobuo Hiratsuka, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1981, Ser. No. 298,811
Claims priority, application Japan, Sep. 2, 1980, 55-120593
Int. Cl.³ G01N *33/54, 33/58, 33/52, 33/74*
U.S. Cl. 436—538 **6 Claims**

1. A method for the simultaneous immunochemical assays of trace components in a sample comprising:

(a) competitively reacting

at least two different and differently labeled antigens or at least two different and differently labeled antibodies, the labels being spectral sensitizing dyes differing from one another in their absorption spectra and at least two antigens or at least two antibodies in the sample being assayed, respectively, for limited binding sites on corresponding antibodies or corresponding antigens, respectively;

(b) contacting either the reaction products resulting from (a) or the unreacted reactants also of (a) with silver halide;

(c) exposing the silver halide resulting from (b) to light having the wavelengths corresponding to the absorption spectra of the spectral sensitizing dyes;

(d) developing the exposed silver halide reslting from (c);

(e) measuring the optical densities resulting from (d); and

(f) determining the amounts of the at least two antigens or the at least two antibodies in the sample by correlations with the optical densities measured in (e).

4,429,051

CERAMIC MATERIALS BY SOL-GEL ROUTE

Roger W. Davidge, Wantage, and James L. Woodhead, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 9, 1982, Ser. No. 356,511
Claims priority, application United Kingdom, Mar. 11, 1981, 8107701
Int. Cl.³ C04B *35/02*
U.S. Cl. 501—12 **5 Claims**

1. A method of preparing a sintered ceramic material in which a refractory material is present in a metastable, high

temperature enantiotropic form in a ceramic matrix, the metastable form having a higher density than its room temperature enantiotropic form, which method comprises the steps of:

(i) preparing a homogeneous mixture of noncolloidal particulate ceramic matrix material, a sol comprising colloidal particles of a precursor for the refractory material dispersed in a liquid medium, and a precursor convertible during step (iii) below to a stabiliser for the metastable form of the refractory material;

(ii) spray drying the homogeneous mixture to produce a powder comprising particles of the ceramic matrix material bonded together by a gel of the refractory material; and

(iii) sintering the powder to give the ceramic material.

4,429,052

MAGNETIC HEXAGONAL FERRITE LAYER ON A NONMAGNETIC HEXAGONAL MIXED CRYSTAL SUBSTRATE

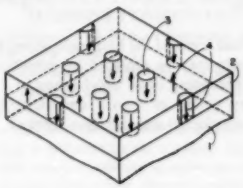
Dieter W. Matelka, Ellerbek, and Ernst-Günter Bartels, Pinneberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 219,030, Dec. 22, 1980, Pat. No. 4,355,072. This application Jul. 6, 1982, Ser. No. 395,160

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005195; Feb. 12, 1980, 3005219

Int. Cl.³ C04B *35/46, 35/48;* **C01F** *11/02;* **C01G** *15/00*

U.S. Cl. 501—135 **5 Claims**



1. A crystalline material consisting essentially of a hexagonal alkaline-earth gallate mixed crystal with a formula

$$A_{1+y}^{2+}Ga_{12-2x-y}B_x^{2+}C_x^{4+}O_{19},$$

where A is one or more elements selected from the group consisting of barium and strontium, B is one or more elements selected from the group consisting of magnesium, manganese, zinc, iron, copper, nickel, cobalt, and chromium, C is one or more elements selected from the group consisting of zirconium, hafnium, titanium, and tin, and

$0.1 \leqq x \leqq 1.2$ and $0 \leqq y \leqq 0.8$.

4,429,053

RARE EARTH-CONTAINING Y ZEOLITE COMPOSITIONS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Calif.

Filed Dec. 4, 1981, Ser. No. 327,611

Int. Cl.³ B01J *29/12, 37/10*

U.S. Cl. 502—65 **42 Claims**

1. A zeolite produced by a method comprising cation-exchanging a crystalline aluminosilicate zeolite of the Y type with rare earth-containing cations, calcining the resultant rare earth-exchanged zeolite in the presence of water vapor at a partial pressure of at least about 0.2 p.s.i.a., ion-exchanging the calcined product with ammonium ions, and subsequently ion-exchanging with Group VIII metal cations.

23. A hydrocracking catalyst comprising a zeolite containing a rare earth metal, Group VIII metal, and hydrogen ions, said catalyst being prepared by a method including the steps of cation exchanging a Y-type zeolite with rare earth-containing cations, calcining the resultant rare earth-exchanged zeolite in the presence of water vapor at a partial pressure of at least 0.2 p.s.i.a., ion-exchanging the calcined product with ammonium ions, subsequently admixing with a refractory oxide component, calcining the resulting admixture so as to convert at least some of the ammonium ions to hydrogen ions, impregnating the calcined admixture with a solution containing Group VIII metal cations under conditions such that at least some Group VIII metal cations are exchanged into the zeolite contained in the calcined admixture, and again calcining.

4,429,054

HYDROCARBON SOLVENT SOLUTIONS OF COMPLEXES OF ISOPROPYLLITHIUM AND ETHYLLITHIUM

Robert C. Morrison, Gastonia, N.C., assignor to Lithium Corporation of America, Bessemer City, N.C.

Filed Jul. 9, 1982, Ser. No. 396,815

Int. Cl.³ B01J *31/12*

U.S. Cl. 502—157 **26 Claims**

17. A composition comprising a clear solution in a liquid hydrocarbon solvent of a complex of isopropyllithium and ethyllithium in which the ratio, on a mole basis, of the isopropyllithium to the ethyllithium is in the range of about 1:9 to about 9:1.

4,429,055

OXIDATION CATALYST

Velliyur Nott M. Rao, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jul. 6, 1982, Ser. No. 395,783

Int. Cl.³ B01J *21/02*

U.S. Cl. 502—202 **1 Claim**

1. A catalyst comprising a boron phosphate support containing from 5 to 20 percent by weight, as based on boron phosphate, of silver.

4,429,056

MANUFACTURE OF OXYGENATED COMPOUNDS

David W. Smith, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 142,287, Apr. 21, 1980, abandoned. This application Nov. 19, 1981, Ser. No. 323,002

Int. Cl.³ C07C *27/06, 31/08*

U.S. Cl. 518—700 **20 Claims**

1. A process for forming acetaldehyde in a first stage reaction and then reducing said aldehyde to form ethanol in a second stage reaction which comprises reacting carbon monoxide and hydrogen at a temperature of from about 150° to about 300° C. and superatmospheric pressure in the presence of a liquid catalyst system consisting essentially of a a ruthenium carbonyl halide complex or a combination of ruthenium carbonyl complex and a separate source of halide selected from the group consisting of an alkali metal chloride, an alkali metal bromide, hydrogen chloride, and hydrogen bromide, and a solvent in which said catalyst components are dissolved at least during said first reaction stage.

4,429,057

PROCESS FOR RECOVERING VOLATILE PRECIOUS METALS

Bernard D. Dombek, and George L. O'Connor, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 191,246, Sep. 26, 1980. This application Aug. 26, 1982, Ser. No. 412,033

Int. Cl.³ C07C *27/06*

U.S. Cl. 518—710 **3 Claims**

1. In a homogenous catalytic process for the production of methanol, ethylene glycol and ethanol wherein a cyclic gase-

ous or vaporized reactant stream comprising carbon monoxide and hydrogen is continuously introduced in a liquid phase mixture comprising (a) a volatile ruthenium catalyst and (b) methanol and/or ethanol, at least a portion of the volatile ruthenium catalyst being continuously removed from the liquid phase mixture by a gaseous and/or vaporized effluent stream, and such a gaseous and/or vaporized stream is an integral component of a cyclic stream of the process and/or a vent stream which is discharged from the process, the improvement for recovering the volatilized ruthenium catalyst and returning it to the liquid phase mixture which comprises passing one or both of said cyclic or vent gaseous or vaporized reactant streams through a liquid body of alcohol selected from the group consisting of methanol, ethanol and mixtures thereof at a temperature sufficiently low to effect the removal of at least a portion of the volatile ruthenium catalyst contained in said cyclic or vent gaseous or vaporized reactant stream, and thereafter periodically or continuously introducing to the liquid phase mixture at least a portion of said liquid body containing the recovered volatilized ruthenium catalyst.

4,429,058

EXPANDABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 8, 1983, Ser. No. 483,406
Int. Cl.³ C08J 9/22
U.S. Cl. 521—57 **3 Claims**

1. In a process for producing an expandable polymeric styrene particle wherein a polymeric styrene particle is impregnated with a blowing agent and the resultant expandable polymeric styrene particle recovered, the improvement which comprises impregnating the polymeric styrene particle with from about 0.025% to about 1.0% of pentaerythritol tetrastearate during impregnation of said polymer with said blowing agent, recovering said polymeric styrene particle and overcoating said particle with from about 0.04% to about 0.4% of glyceryl monostearate, all percentages being based on the weight of said polymeric styrene.

4,429,059

PROCESS FOR PRODUCING FOAMABLE POLYOLEFIN PARTICLES

Shunichi Ozutsumi, and Osamu Yamamoto, both of Nara, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed May 16, 1983, Ser. No. 495,108
Claims priority, application Japan, May 14, 1982, 57-82168
Int. Cl.³ C08J 9/18
U.S. Cl. 521—60 **5 Claims**

1. A process for producing foamable resin particles which comprises adding a mixture of 3 to 15 parts by weight of a blowing agent and 0.5 to 5 parts by weight of a blowing aid to 100 parts by weight of polyolefin particles in a fluid state, the particles comprising a resin prepared by polymerizing 20 to 70 wt. % of polyolefin resin and 80 to 30 wt. % of vinyl aromatic monomer in an aqueous medium so that the vinyl aromatic resin is chemically bonded to the polyolefin resin, and the blowing aid is miscible with the resin particles and has a boiling point of about 80° C. to about 150° C., wherein the adding is conducted under substantially anhydrous conditions so that the blowing agent is present in the particles in a gas phase and not a liquid phase.

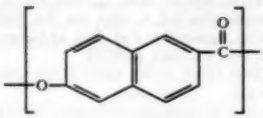
4,429,060

LIGHTWEIGHT HIGH PERFORMANCE FOAMS OF THERMOTROPIC LIQUID CRYSTAL POLYMERS COMPRISING RECURRING 6-OXY-2-NAPHTHOYL MOIETIES

Yoshiaki Ide, N. Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 282,888, Jul. 13, 1981, abandoned. This application Nov. 15, 1982, Ser. No. 441,807
The portion of the term of this patent subsequent to Jan. 31, 2000, has been disclaimed.
Int. Cl.³ C08J 9/08, 9/10
U.S. Cl. 521—182 **24 Claims**

1. A polymer foam which exhibits good thermal stability, flame and solvent resistance and desirable mechanical properties such as high strength comprising a rigid foamed wholly aromatic polyester which exhibits anisotropic properties in the melt phase and consists of monomers having chain extending linkages that are either coaxial or parallel and which comprises not less than about 10 mole percent of recurring units of the moiety:



and wherein at least some of the hydrogen atoms present upon the rings optionally may be replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, substituted phenyl and mixtures thereof.

4,429,061

HEAT TREATED HIGH PERFORMANCE FOAMS OF THERMOTROPIC LIQUID CRYSTAL POLYMERS

Yoshiaki Ide, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 282,828, Jul. 13, 1981, abandoned. This application Nov. 15, 1982, Ser. No. 441,655
Int. Cl.³ C08J 9/08, 9/10
U.S. Cl. 521—182 **38 Claims**

1. A thermotropic liquid crystal polymer foam which exhibits good thermal stability, flame and solvent resistance and desirable mechanical properties such as high strength comprising a rigid foamed wholly aromatic polyester which exhibits anisotropic properties in the melt phase and consists of monomers having chain extending linkages that are either coaxial or parallel and which comprises not less than about 10 mole percent of recurring units which include a naphthalene moiety and which has been subjected to a heat treatment at a temperature below the melting temperature of the polymer and for a time sufficient to increase the melting temperature of the polymer at least 10 centigrade degrees.

4,429,062

PHARMACEUTICALLY ACCEPTABLE SILICON RUBBER AND THERAPEUTICAL SET AND THE USE THEREOF FOR SURGICAL EMBOLIZATION

Emil Pasztor, 4 Rakoczi-u, Budapest, Hungary (1072); Laszlo Lazar, 4, Rozsahegy-u, Budapest, Hungary (1024); Jozsef Nagy, 46/b, Töröbalinti-u, Budapest, Hungary (1122), and Katalin Pallosy nee Becker, 31, Vinceller-u., Budapest, Hungary (1113)

Filed Feb. 17, 1981, Ser. No. 235,084
Claims priority, application Hungary, Feb. 18, 1980, 369/80
Int. Cl.³ A61K *6/08*
U.S. Cl. 523—118 **6 Claims**

1. A silicon rubber mixture for surgical embolization comprising

(a) a linear, low viscosity polysiloxane selected from the group consisting of dialkyl, alkylaryl, alkenylalkyl, and diaryl polysiloxanes having reactive functional groups selected from the group containing of hydroxy, acyloxy, alkoxy and amino;

(b) a cyclic dialkyl polysiloxane having the formula $[R_2Si-O]_4$, wherein R is alkyl; and

a pharmaceutically acceptable iodo-containing organosilicium or X-ray contrast material non-metallic organic X-ray contrast material.

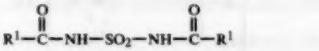
4,429,063

ANAEROBICALLY CURABLE SEALANT AND ADHESIVE COMPOSITION

Karl Reich, Carlsberg, Fed. Rep. of Germany, assignor to W. R. Grace & Co., New York, N.Y.

Filed Sep. 15, 1982, Ser. No. 418,497
Int. Cl.³ C08K *5/43*; C09K *3/10*
U.S. Cl. 523—176 **8 Claims**

1. An anaerobically curable sealant and adhesive composition comprising a polymerizable acrylate ester monomer selected from the group consisting of mono acrylate, diacrylate, triacrylate, monomethacrylate, dimethacrylate and trimethacrylate ester, a redox system as accelerator, and a sulfamide compound of the general formula



in which the groups R^1 which may be identical or different are each a radical selected from the group consisting of linear or branched alkyl with 1 to 18 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, phenylmethyl, trifluoro- or trichloromethyl or hydrocarbyloxy $—OR^2$, R^2 being selected from the group consisting of linear or branched alkyl with 1 to 18 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, phenyl, di- or triphenylmethyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl group, or alkylphenyl with 1 to 4 carbon atoms in the alkyl radical or radicals.

4,429,064

MICA-REINFORCED POLYOLEFIN COMPOSITIONS COMPRISING A MALEAMMIC SILANE MODIFIER

Roberto Marzola; Enea Garagnani, both of Ferrara, and Alessandro Moro, Occhiobello, all of Italy, assignors to Montedison S.p.A., Milan, Italy

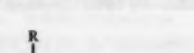
Filed Jun. 29, 1982, Ser. No. 393,422
Claims priority, application Italy, Jul. 3, 1981, 22732 A/81
Int. Cl.³ C08J *5/12*; C08K *3/34, 5/20*; C08L *23/02*
U.S. Cl. 523—213 **2 Claims**

1. Polyolefinic compositions comprising from 30% to 90% by weight of an olefinic homopolymer or copolymer and from 70% to 10% by weight of mica pretreated by the addition on its surface of from 0.01% to 7% by weight, referred to the weight of the mixture of polymer and mica, of at least one compound having the general formula

wherein

z is an integer equal to 0 or 1;

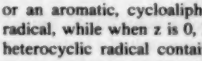
X, when z is 1 is a radical of formula



or an aromatic, cycloaliphatic or heterocyclic divalent radical, while when z is 0, X is an aliphatic, aromatic or heterocyclic radical containing a functional, aminic, or epoxy, mercaptan, ester, vinyl or halogen group;

R_1 is hydrogen; and

Y is a silane group of formula



in which

Z is an alkoxyl hydrolyzable group containing from 1 to 6 carbon atoms; and

n is an integer from 1 to 3, extremes included.

4,429,065

CONTROLLED DENSITY HYDRAULIC FLUIDS

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Filed Aug. 10, 1981, Ser. No. 291,243
Int. Cl.³ C08J *3/02*
U.S. Cl. 523—223 **28 Claims**

1. A low density liquid suspension comprising:

a. a suspending liquid; and

b. a multiplicity of hollow, gas-containing polymer particles having a density substantially lower than the density of said suspending liquid, said particles having smooth outer surfaces wettable by said suspending liquid.

4,429,066

ADDITIVE FOR COATING COMPOSITIONS CONTAINING N-PROPYL AMINE SALT OF SULFONIC ACID

Thomas C. Gilmer, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,842
Int. Cl.³ C08K *3/36, 3/08*
U.S. Cl. 524—158 **19 Claims**

1. An additive for coating compositions consisting essentially of about

a. 50–87.5% by weight, based on the weight of the rheology control additive, of colloidal hydrophilic silica having a particle size of about 0.2–1000 millimicrons and has a surface area of about 50–1200 square meters per gram,

b. 0.5–5.0% by weight, based on the weight of the rheology control additive, of a polymeric bridging agent selected from the group consisting of nonionic fluorocarbon polymer having ethylene oxide linkages and a weight average molecular weight of about 5,000–50,000 and containing about 2–25% by weight, based on the weight of the fluorocarbon polymer, of fluorine, a polyvinyl pyrrolidone having a weight average molecular weight of about 3,000–500,000, or a polyethylene glycol having a weight average molecular weight of about 800–400,000,

c. 10–30% by weight, based on the weight of the rheology control additive, of an aromatic sulfonic acid and

d. 2–15% by weight, based on the weight of the rheology control additive, of n-propyl amine.

4,429,067
POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS

Sumner A. Barenberg, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

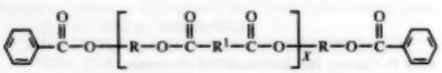
Filed Oct. 27, 1982, Ser. No. 437,752
Int. Cl.³ C08L 67/00; C08K 5/10
U.S. Cl. 524—299 **12 Claims**

1. A polyethylene terephthalate dry blend consisting essentially of

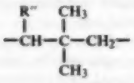
(a) 20–90% by weight of components (a), (b) and (c) of at least one polyethylene terephthalate having an inherent viscosity of at least 0.4 dl/g, as measured by ASTM D-2857,

(b) 1–10% by weight of components (a), (b) and (c) of at least one sodium or potassium salt of a hydrocarbon carboxylic acid of 9–25 carbon atoms or at least one sodium or potassium salt of an ionic hydrocarbon copolymer of an α-olefin of 2–5 carbon atoms and an α,β-ethylenically unsaturated carboxylic acid of 3–5 carbon atoms in which the carboxyl groups have been at least partially neutralized with Na^+ or K^+ cations, provided the amount present is sufficient to provide a H_H/H_C ratio of less than 0.25 to the blend,

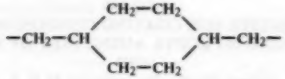
(c) 0.1–10% by weight of components (a), (b) and (c) of at least one benzoate oligomer of the formula



wherein —R— is selected from the class consisting of



wherein —R″ is H— or alkyl of 1–3 carbon atoms or



—R^1— is selected from the class consisting of alkylene of 2–6 carbon atoms, arylene or alicyclic alkylene of 6–8 carbon atoms, and X is a cardinal number of between 1 ad 5, provided that the amount present is sufficient to lower the TpK of a blend of (a) and (b) by at least about 4° C.

4,429,068
RUBBER MATERIAL

Akitaro Nakahira, Takarazuka, Japan, assignor to Hohyu Rubber Co., Ltd., Ikeda, Japan

Filed Nov. 19, 1981, Ser. No. 323,047
Claims priority, application Japan, Nov. 20, 1980, 55-164192; May 20, 1981, 56-77077
Int. Cl.³ C08K 5/41; C08L 7/00, 9/06, 21/02
U.S. Cl. 524—302 **14 Claims**

1. A rubber material which is a cured rubber of a rubber comprising (A) 100 parts by weight of a rubber component, (B) 100 to 2,000 parts by weight of a factice, and (C) 200 to 2,000 parts by weight of a softening agent, the cured rubber having a hardness of from a maximum of 30° as measured with an A-type rubber hardness tester to a minimum of 15° as measured with an F-type rubber hardness tester, an impact resilience of not less than 50% and a tensile strength of 0.1 to 100 kg/cm^2.

4,429,069
FLAME RETARDANT POLYURETHANE COMPOSITION

David O. Williams, Hoffman States, Ill., assignor to Saytech, Inc., Sayreville, N.J.

Division of Ser. No. 367,283, Apr. 12, 1982. This application Jun. 15, 1983, Ser. No. 504,630
Int. Cl.³ B32B 5/20; C08G 18/14
U.S. Cl. 524—469 **4 Claims**

1. A polymer composition containing a polyurethane and a flame retardant a flame retardant amount of tribromocumene.

4,429,070
TWO PHASE ALLOY POLYMER FROM COREACTED BLENDS OF AN ACID CONTAINING EMULSION COPOLYMER AND A CHLOROHYDROXY AMMONIUM LIPOSALT EMULSION COPOLYMER

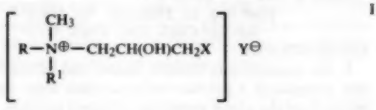
Mary L. Gioeni, Ambler, and Richard F. Merritt, Ft. Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 12, 1981, Ser. No. 320,283
Int. Cl.³ C08L 37/00
U.S. Cl. 524—517 **11 Claims**

1. Composition comprising an emulsion useful for coating compositions, binders for non-wovens, and adhesives comprising a blend of:

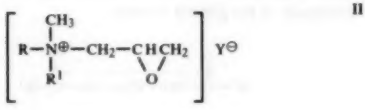
A. an emulsion acid copolymer, and

B. an emulsion halohydroxypropyl ammonium liposalt copolymer of a liposalt monomer of the formula



I

or



II

wherein

R is an ethylenically unsaturated group;

R^1 is a linear C_1–C_4 alkyl or hydroxyalkyl group;

X is chlorine, bromine, or iodine; and

$Y^\ominus$ is a surfactant anion containing at least 6 carbon atoms or, where said anion contains an aralkyl group, at least 8 carbon atoms,

and at least one other ethylenically unsaturated monomer except acid or anhydride, at least one of A or B being film forming at application temperature, (A) and (B) not being mutually soluble or compatible.

4,429,071
VINYL CHLORIDE PLASTISOL COMPOSITIONS

Shojiro Itoh; Masayuki Murashige, and Toshio Igarashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 3, 1981, Ser. No. 270,065
Claims priority, application Japan, Jun. 12, 1980, 55-79649
Int. Cl.³ C08L 27/00
U.S. Cl. 524—569 **7 Claims**

1. A vinyl chloride plastisol composition comprising 100 parts by weight of a vinyl chloride paste resin and 35 to 180 parts by weight of a plasticizer, said vinyl chloride paste resin having an average particle size of 0.5 to 10 microns, and being composed of 5 to 80% by weight of tetrahydrofuran-insoluble

micro-gel fraction and 20 to 95% by weight of tetrahydrofuran-soluble fraction.

4,429,072

PREPARATION OF AQUEOUS THERMOSETTING ELECTRICAL INSULATING VARNISHES, AND USE OF THE VARNISHES

Udo Reiter, Mutterstadt, and Helmut Lehmann, Reinbek, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,494

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137385

Int. Cl.³ B32B *15/00;* **C09D** *3/64, 5/25;* **H01B** *3/42*

U.S. Cl. 524—591 **13 Claims**

1. A process for the preparation of aqueous thermosetting electrical insulating varnishes based on polyester-imides, which are obtained by condensing aromatic tricarboxylic acid monoanhydrides, diamines, diols and triols containing an isocyanurate ring, with or without aromatic dicarboxylic acids or their esterifiable derivatives, wherein

(A) an aromatic tricarboxylic acid monoanhydride,

(B) an aromatic diamine,

(C) a triol containing an isocyanurate ring,

(D) an aliphatic diol and

(E) a cyclic trimerization product of a diisocyanate, whose free isocyanate groups are blocked, with or without

(F) an aromatic dicarboxylic acid or its esterifiable derivatives

are co-condensed at from 120° to 240° C., the precondensate thus obtained is reacted—with or without addition of from 1 to 10% by weight, based on polyester-imide precondensate, of a polar organic solvent boiling above 100° C. under atmospheric pressure—with ammonia or an organic amine at from 50° to 200° C., the product is then diluted with fully demineralized water and, if appropriate, a water-soluble curing catalyst is added.

4,429,073

POLYETHERIMIDE COMPOSITIONS AND PROCESSES FOR PRODUCTION

Denis R. Pauze, Scotia, and Raymond B. Hughes, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 190,030, Sep. 23, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,095

Int. Cl.³ C08G *73/10;* **C08L** *79/08*

U.S. Cl. 524—600 **6 Claims**

1. A process for preparing a water soluble coatable resin material comprising preparing a solution of polyetherimide polymer in a solvent therefor and mixing said solubilized polymer at ambient temperature with sufficient water to obtain the desired final viscosity in the presence of from about 15% to about 35% amine by weight of the polyetheramide solid resin material.

4,429,074

PAPER COATING COMPOSITION AND ITS PRODUCTION

Saburo Mishiba; Kiyonari Ohta; Kazumasa Fujieda, all of Niihama; Kojiro Matsumoto, Takarazuka, and Akira Uchida, Nara, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Continuation of Ser. No. 108,078, Nov. 19, 1981, abandoned. This application Nov. 25, 1981, Ser. No. 324,906

Claims priority, application Japan, Dec. 28, 1978, 53-162988

Int. Cl.³ C08F *2/24, 236/06;* **C08K** *3/34*

U.S. Cl. 524—819 **6 Claims**

1. A coating composition for paper comprising a mineral pigment and a polymer latex prepared by emulsion polymerization of a monomeric mixture comprising 1,3-butadiene, an ethylenically unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic acid and itaconic acid, and at least one monoolefinic monomer selected from the group consisting of an alkenyl aromatic compound, an alkyl ester of an unsaturated carboxylic acid, a hydroxyalkyl group containing unsaturated compound and a vinyl cyanide compound in a weight proportion of 24.5–50:0.5–5:45–75 in the presence of a chain transfer agent, characterized in that the chain transfer agent is, in combination, carbon tetrachloride and an alkylmercaptan selected from the group consisting of n-octylmercaptan, n-decylmercaptan, n-dodecylmercaptan, t-dodecylmercaptan, t-hexadecylmercaptan, n-tetradecylmercaptan, and t-tetradecylmercaptan wherein the carbon tetrachloride and the alkylmercaptan are respectively used in amounts of from 0.5 to 10 parts by weight and of from 0.05 to 1 part by weight to 100 parts by weight of the monomer mixture.

4,429,075

CROSS-LINKED UREA-FORMALDEHYDE POLYMER MATRIX COMPOSITIONS CONTAINING CYCLIC INTERMEDIATE STRUCTURES

John E. Carlson, Statesboro, Ga., assignor to Chem-Nuclear Systems, Inc., Columbia, S.C.

Filed May 17, 1982, Ser. No. 378,871

Int. Cl.³ C08L *61/24*

U.S. Cl. 524—35 **21 Claims**

1. A process for producing a cross-linked urea-formaldehyde polymer matrix composition which comprises forming a fluid mixture of:

(a) a urea-formaldehyde resin;

(b) a liquid urea-formaldehyde concentrate;

(c) powdered or prilled urea; and

(d) water;

agitating the mixture until complete dissolution of the solid urea has occurred and the mixture is substantially free of formaldehyde odor;

adding sufficient catalyst to the mixture to produce a controlled set to form a cross-linked urea-formaldehyde polymer matrix.

4,429,076

THERMOPLASTIC POLYMER COMPOSITION

Akira Saito, Fujisawa; Akio Yamori, Kawasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1980, Ser. No. 157,167

Claims priority, application Japan, Jun. 13, 1979, 54-73492; Feb. 16, 1980, 55-17210; Feb. 16, 1980, 55-17212; Feb. 16, 1980, 55-17213; Feb. 16, 1980, 55-17214; Feb. 16, 1980, 55-17215; Feb. 22, 1980, 55-20568; Feb. 22, 1980, 55-20582

Int. Cl.³ C08L *29/04*

U.S. Cl. 525—57 **49 Claims**

1. A thermoplastic polymer composition comprising:

(a) 1 to 99 parts by weight of a component A consisting essentially of at least one member selected from the group consisting of modified block copolymers and the ionically crosslinked products of at least one said modified block copolymer with at least one univalent, bivalent, or trivalent metal ion, said modified block copolymer comprising a block copolymer of at least one aromatic vinyl compound and at least one conjugated diene compound onto which at least one molecular unit containing at least one dicarboxylic acid group or the derivative thereof is grafted; and

(b) 99 to 1 parts by weight of a component B consisting essentially of at least one thermoplastic polymer containing at least one polar group and selected from the group consisting of polyamides, polyurethanes, vinylalcohol polymers, polyacrylates, polymethacrylates, chlorinated hydrocarbon polymers, and ionomers.

4,429,077

PROCESS FOR CURING STOVING LACQUERS

Friedrich Karrer, Zofingen; Godwin Berner, Rheinfelden, and Jean Rody, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

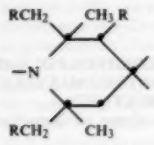
Filed Dec. 9, 1981, Ser. No. 328,885

Claims priority, application Switzerland, Dec. 19, 1980, 9408/80

Int. Cl.³ B01J *31/02*; C08L *33/00, 61/06, 61/28*

U.S. Cl. 525—143 10 Claims

1. A process for curing acid curable stoving lacquers by warming in the presence of a curing catalyst, wherein the curing catalyst used is either (a) an acid addition salt of a basic polyalkylpiperidine derivative which contains a group of the formula I



(I)

in which R is hydrogen or methyl, and an inorganic or organic acid, or (b) the inner salt of a sulfonic acid which contains a group of the formula I.

4,429,078

ANISOTROPIC MELT-FORMING POLYMER COMPOSITION CONTAINING PTFE

Frederic N. Cogswell, Welwyn Garden City, and Martin S. Swerdlow, New Barnet, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 30, 1981, Ser. No. 316,914

Claims priority, application United Kingdom, Nov. 7, 1980, 8035800

Int. Cl.³ C08L *67/02, 27/18*

U.S. Cl. 525—165 8 Claims

1. A composition formed from a blend of a polymer of PTFE and a polymer capable of exhibiting an anisotropic melt characterised in that the composition contains between 0.05 and 5.0% by weight of PTFE.

4,429,079

ETHYLENE/ALPHA-OLEFIN COPOLYMER COMPOSITION

Yuzo Shibata, Nishinomiya, and Seikoh Naganuma, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Japan

PCT No. PCT/JP81/00173, § 371 Date Mar. 11, 1982, § 102(e) Date Mar. 11, 1982, PCT Pub. No. WO82/00470, PCT Pub. Date Feb. 18, 1982

PCT Filed Aug. 7, 1981, Ser. No. 359,714

Claims priority, application Japan, Aug. 7, 1980, 55-107788

Int. Cl.³ C08L *23/08*

U.S. Cl. 525—240 7 Claims

1. An ethylene/alpha-olefin copolymer composition characterized by comprising a mixture of 95 to 40% by weight of (A) a random copolymer of ethylene and an alpha-olefin having 5 to 10 carbon atoms having a melt index of 0.1 to 20 g/10 min., a density of 0.910 to 0.940 g/cm³, a crystallinity by X-rays of 40 to 70%, a melting point of 115° to 130° C. and an ethylene content of 94 to 99.5 mole%, and 5 to 60% by weight of (B) a random copolymer of ethylene and an alpha-olefin having 3 to 10 carbon atoms having a melt index of 0.1 to 50 g/10 min., a density of 0.870 to 0.900 g/cm³, a crystallinity by X-rays of 5 to 40%, a melting point of 40° to 100° C. and an ethylene content of 85 to 95 mole%.

4,429,080

SYNTHETIC COPOLYMER SURGICAL ARTICLES AND METHOD OF MANUFACTURING THE SAME

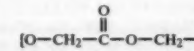
Donald J. Casey, Ridgefield, and Mark S. Roby, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 1, 1982, Ser. No. 394,347

Int. Cl.³ C08G *63/76*; C08L *67/00*

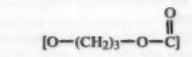
U.S. Cl. 525—415 10 Claims

1. A surgical article manufactured from a fiber having a bending modulus of less than 500,000 psi, said fiber manufactured from a triblock copolymer comprising a proportion of units having the formula:



(I)

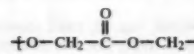
as the end blocks, said formula (I) as an end block having a hydrogen atom attached to the terminal oxygen atom, and the formula (I) randomly combined with a proportion of units having the formula:



(II)

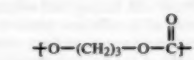
as the middle block wherein the middle block comprises 70–95 percent, by weight, of units of formula II and the total copolymer comprises 30–40 percent, by weight, of units of formula II.

2. A method for the manufacture of a surgical article manufactured from a synthetic absorbable copolymer formed by copolymerizing glycolide with 1,3-dioxan-2-one wherein a combination of the monomers is substantially completely polymerized before the addition of the other monomer, the improvement comprising substantially completely polymerizing the combination in the presence of a difunctional initiator at about 180° C.; increasing the temperature up to about the melting point of polyglycolide; and adding glycolide to form a triblock copolymer comprising a proportion of units having the formula:



(I)

as the end blocks, and the formula (I) randomly combined with a proportion of units having the formula:



(II)

as the middle block.

4,429,081

METHOD FOR THE PREPARATION OF POLYETHER ESTER AMIDES

Salih Mumcu, Marl, and Hans J. Panoch, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 169,111, Jul. 10, 1980, Pat. No. 4,345,052. This application Jun. 28, 1982, Ser. No. 392,688

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932234

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ C08L *77/00, 77/06, 77/12*

U.S. Cl. 525—420 10 Claims

1. A method for preparing polyether ester amides, comprising:

(A) preparing a mixture of polyamides and polyethers selected from the group consisting of
(a) polyamides having carboxyl end groups and polyethers having hydroxyl end groups and amino end groups;
(b) polyamides having carboxyl end groups and polyethers having hydroxyl end groups;
(c) polyamides having carboxyl end groups and polyethers having amino end groups; and
(d) polyamides having amino end groups and polyethers having carboxyl end groups;
(B) treating the mixture of (A) as a hot melt at a temperature between about 200° to 300° C. and under a water vapor pressure of about 5 to 25 bars with mechanical agitation for a period sufficient to hydrolyze the polyamide;
(C) removing the water from (B) by decompression; and
(D) carrying out a polycondensation of said treated, water-free mixture.

4,429,082

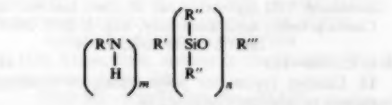
FILM-FORMING RESINS CONTAINING ALKOXY SILANE GROUPS

Kyu-Wang Lee, Danville, Calif.; John R. Peffer; Robert Piccirilli, both of Pittsburgh, Pa., and Wen-Hsuan Chang, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 10, 1982, Ser. No. 376,329
Int. Cl.³ C08F *283/04*
U.S. Cl. 525—426 **44 Claims**

1. An essentially anhydrous ungelled reaction product characterized in having a non-vinyl addition backbone being essentially acrylyl-free, having a silicon content of up to about 12 percent, and derived from the reaction of (a) a condensation product having at least 2 amine reactive acrylyl residues per molecule and (b) an amino silane of formula

where each X is independently a (1) hydrogen, (2) alkyl, aryl, or cycloalkyl group having from 1 to 10 carbon atoms, or (3)



where each R' is independently an alkylene group having from 2 to 10 carbon atoms, m is from 0 to 2, each R'' is independently a hydrogen, alkyl, aryl, cycloalkyl, alkoxy, or aryloxy group having from 1 to 8 carbon atoms, n is from 1 to 5 and R''' is an alkyl group having from 1 to 8 carbon atoms, with the proviso at least one X is a radical containing silicon.

2. The reaction product of claim 1 wherein the condensation product is selected from the group consisting of a hydrocarbonpolyol polyacrylate, saturated polyesterpolyol polyacrylate, alkydpolyol polyacrylate, urethanepolyol polyacrylate, polyurethanepolyol polyacrylate, amidepolyol polyacrylate, polyamidepolyol polyacrylate, etherpolyol polyacrylate, polyetherpolyol polyacrylate, and mixtures thereof.

4,429,083

PROCESS FOR THE PRODUCTION OF POLYESTERPOLYCARBONATE

Takashi Nakagawa, and Norio Ogata, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 417,875
Claims priority, application Japan, Oct. 5, 1981, 56-157589; Oct. 5, 1981, 56-157590
Int. Cl.³ C08G *63/64*
U.S. Cl. 525—439 **9 Claims**

1. A process for producing polyesterpolycarbonate which comprises reacting an aqueous alkaline solution of dihydric phenol and an organic solvent solution of acid chloride, the molar ratio of the dihydric phenol to the acid chloride being from 1:0.5 to 1:0.75, at a temperature of from 5° to 40° C. for 0.05 to 60 minutes to prepare a polyester oligomer containing terminal hydroxyl group, mixing a chloroformate group-containing polycarbonate oligomer with said polyester oligomer, and polycondensing the polyester oligomer and the polycarbonate oligomer at a temperature of from 0° to 40° C. for 15 to 180 minutes.

4,429,084

METHOD FOR FORMING A GROUT COMPOSITION

Daniel M. Piccirilli, and David M. Piccirilli, both of 3480 Commerce Rd., Orchard Lake, Mich. 48033

Filed May 9, 1983, Ser. No. 492,931
Int. Cl.³ C08F *2/10*
U.S. Cl. 526—88 **7 Claims**

1. A method for forming a grout composition from multiple components comprising the steps of:
placing a pre-determined quantity of a first component in a water soluble container;
mixing a pre-determined number of the water soluable containers containing the first component with water in a first mixing tank;
mixing a pre-determined quantity of a first catalyst with the water and the first component in the first mixing tank;
mixing a pre-determined quantity of a second catalyst with water in a second mixing tank; and
combining the solutions within the first and second mixing tanks to cause a polymerization-cross linking reaction of the first component such that the first components solidify.

4,429,085

MICROENCAPSULATED AQUEOUS POLYMERIZATION CATALYST

James N. Henderson, Hudson; Ken W. Donbar; John J. Barbour, both of Akron, and Anthony J. Bell, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 17, 1982, Ser. No. 419,261
Int. Cl.³ C08F *4/26*
U.S. Cl. 526—92 **34 Claims**

1. A process for producing polybutadiene composed essentially of syndiotactic 1,2-polybutadiene in an aqueous medium comprising polymerizing 1,3-butadiene in said aqueous medium in the presence of (1) a catalyst composition which contains (a) at least one cobalt compound selected from the group consisting of (i) β-diketone complexes of cobalt, (ii) β-keto acid ester complexes of cobalt, (iii) cobalt salts of organic carboxylic acids having 6 to 15 carbon atoms, and (iv) complexes of halogenated cobalt compounds of the formula CoX_n,

wherein X represents a halogen atom and n represents 2 or 3, with an organic compound selected from the group consisting of tertiary amine alcohols, tertiary phosphines, ketones and N,N-dialkylamides, and (b) at least one organoaluminum compound of the formula AlR_3 wherein R represents a hydrocarbon radical of 1 to 6 carbon atoms, wherein said catalyst composition is microencapsulated in a polyene product; and (2) carbon disulfide.

4,429,086
Patent Not Issued For This Number

4,429,087
POLYMERIZATION CATALYST AND PROCESS
Charles E. Capshew, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 175,219, Aug. 4, 1980, Pat. No. 4,328,121. This application Mar. 11, 1982, Ser. No. 357,120
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—119 **12 Claims**

1. A polymerization process comprising contacting at least one aliphatic mono-olefin under polymerization conditions in the presence of a catalyst which is formed by

(1) mixing together a first catalyst component comprising a metal hydrocarbyloxide compound having the formula $M(OR)_2$) where M is a metal selected from Group IIA and Group IIB of the Mendeleev Periodic Table and R is the same or different and is a hydrocarbyl group having from 1 to 20 carbon atoms and a transition metal hydrocarbyloxide compound in which the transition metal is selected from the group consisting of Group IVB and Group VB transition metals of the Mendeleev Periodic Table and wherein the hydrocarbyl group is as defined above in a molar ratio of transition metal compound to metal compound ranging from about 2:1 to about 1:2,

(2) heating the first catalyst component solution formed in (1),

(3) cooling the first catalyst component solution to a temperature below about 25° C. and optionally filtering the first catalyst component solution to remove any undissolved material from the cooled first catalyst component solution,

(4) adding a precipitating agent comprising a second catalyst component in a molar ratio of transition metal compound to the precipitating agent within a range of about 2:1 to about 1:3 to the cooled first catalyst component solution which is at a temperature ranging from about −50° C. to about 25° C. under conditions so as to avoid a significant temperature rise in the solution and to produce a solid catalyst in the form of a slurry with the solvent, said second catalyst component comprising an organoaluminum halide represented by the formulas

$$R\,Al\,X_2$$

$$R_2\,Al\,X, \text{ and}$$

$$R_3\,Al_2\,X_3$$

wherein each R in the above formulas is as defined before and each R can be the same or different, and X is a halogen atom,

(5) washing and drying the solid catalyst component thus formed and contacting same with a transition metal halide ion exchange source selected from titanium tetrachloride, vanadium oxychloride ($VOCl_3$), and zirconium tetrachloride in a weight ratio of transition metal halide to said solid catalyst component ranging from about 7:1 to about 1:4,

(6) separating the solid catalyst component formed in (5) and washing same, and,

(7) combining the washed and dried solid catalyst component separated in (6) with a cocatalyst component comprising an organoaluminum compound.

4,429,088
ADHESIVE COMPOSITION
Andrew G. Bachmann, Burlington Rd., Harwinton, Conn. 06791
Division of Ser. No. 156,475, Jun. 4, 1980, Pat. No. 4,348,503. This application Mar. 8, 1982, Ser. No. 355,466
Int. Cl.³ C08F *4/06, 2/00*; C08L *75/12*
U.S. Cl. 526—135 **2 Claims**

1. In an adhesive composition containing an acrylic ester capable of free-radical polymerization to produce, upon polymerization thereof, an adhesive solid, the improvement comprising: a latent catalyst system includirg, in amounts based upon the weight of the monomer, about 1 to 10 parts per hundred of an aromatic perester free-radical precursor, about 0.5 to 10 parts per hundred of an organic acid capable of cyclic tautomerism, and up to about 500 parts per million of a soluble compound of a transition metal cure accelerator, said composition being free-from any organic hydroperoxide catalyst, being stable against polymerization regardless of the presence or absence of oxygen, and being readily cured by reaction with an amine/aldehyde adduct curing agent.

4,429,089
POLYMERIZING AND COPOLYMERIZING DIOLEFINES, AND MEANS THEREFOR
Ugo Pedretti, Milan; Gabriele Lugli, San Donato Milanese; Sergio Poggio, Milan, and Alessandro Mazzei, San Donato Milanese, all of Italy, assignors to Anic, S.p.A., Palermo, Italy
Continuation of Ser. No. 129,640, Mar. 12, 1980, abandoned, which is a continuation of Ser. No. 928,552, Jul. 27, 1978, abandoned. This application Jul. 15, 1981, Ser. No. 283,615
Claims priority, application Italy, Aug. 1, 1977, 26377 A/77
Int. Cl.³ C08F *4/72, 36/04*
U.S. Cl. 526—153 **14 Claims**

11. Catalyst system for polymerizing or copolymerizing butadiene or isoprene composed of:

(A) an aluminum trialkyl having the formula

$$AlR_3$$

wherein R is an alkyl radical containing from 1 to 20 carbon atoms,

(B) an aluminum halide or alkyl aluminum halide having the formula

$$AlX_aR_{3-a}$$

wherein R is an alkyl radical containing from 1 to 20 carbon atoms, X is chlorine or bromine and a is an integer from 1 to 3, and

(C) Neodymium alcoholate having the formula,

$Nd(OR)_3$

wherein R is an alkyl radical containing from 1 to 20 carbon atoms.

4,429,090

CATALYST CONTAINING OLIGOMERIC OXOLANYL ALKANE MODIFIERS AND PROCESS FOR THE PRODUCTION OF POLYMERS HAVING INCREASED 1,2-MICROSTRUCTURE

James E. Hall, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 9, 1983, Ser. No. 473,472
Int. Cl.³ C08F 4/48
U.S. Cl. 526—177 **11 Claims**

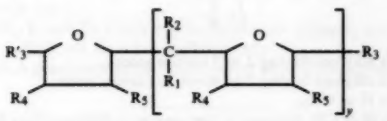
1. A catalyst system comprising:

(a) at least one anionic initiator based on lithium,

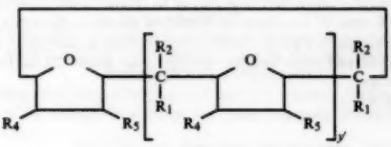
(b) at least one compound selected from the group consisting of a dialkyl magnesium compound and a trialkyl aluminum compound, and

(c) at least one oxolanyl compound selected from the group consisting of:

(i)



(ii)



wherein R_1 and R_2 independently are hydrogen or an alkyl group and the total number of carbon atoms in $-CR_1R_2-$ ranges between one and nine inclusive; y is an integer of 1 to 5 inclusive, y' is an integer of 3 to 5 inclusive, R_3', R_3, R_4 and R_5 independently are —H or $-C_nH_{2n+1}$ wherein n = 1 to 6.

4,429,091

OLIGOMERIC OXOLANYL ALKANES AS MODIFIERS FOR POLYMERIZATION OF DIENES USING LITHIUM-BASED INITIATORS

James E. Hall, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

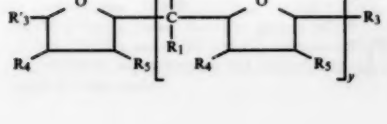
Filed Mar. 9, 1983, Ser. No. 473,473
Int. Cl.³ C08F 4/48
U.S. Cl. 526—181 **10 Claims**

1. A catalyst system comprising:

(a) at least one anionic initiator based on lithium, and

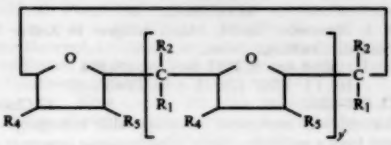
(b) at least one oxolanyl compound selected from the group consisting of:

(i)



-continued

(ii)



wherein R_1 and R_2 independently are hydrogen or an alkyl group and the total number of carbon atoms in $-CR_1R_2-$ ranges between one and nine inclusive; y is an integer of 1 to 5 inclusive, y' is an integer of 3 to 5 inclusive, R_3', R_3, R_4 and R_5 independently are —H or $-C_nH_{2n+1}$ wherein n = 1 to 6.

4,429,092

ROOM TEMPERATURE POLYMERIZATION OF ACRYLATE MONOMERS WITH PEROXYESTERS

Gary P. Sterling, San Rafael, Calif., assignor to U.S. Peroxygen Company, Richmond, Calif.

Filed Dec. 6, 1982, Ser. No. 446,904
Int. Cl.³ C08F 4/10, 4/16
U.S. Cl. 526—192 **20 Claims**

1. A composition useful for preparing polymeric articles at ambient temperature and pressure comprising:

(a) a polymerizable component selected from monomeric and polymeric aliphatic acrylics substantially free of ethylene monomer having a Brookfield viscosity of about 0.1–400 poise and about 5–60% by weight of solids;

(b) copper and tin polymerization promoters providing in the composition about 0.05–4 ppm of Cu^{+2} and about 10–330 ppm of Sn^{+2};

(c) about 5×10^{-6} to 1×10^{-4} mole/gm of the composition of a primary mercaptan chain transfer agent; and

(d) sufficient peroxyester initiator to provide about 0.02–0.3% by weight of active oxygen in the composition.

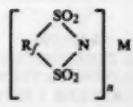
4,429,093

CYCLIC PERFLUOROALIPHATICDISULFONIMIDES AS POLYMERIZATION CATALYSTS

Robert J. Koshar, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 229,870, Jan. 30, 1981, Pat. No. 4,387,222.
This application Mar. 7, 1983, Ser. No. 472,956
Int. Cl.³ C08F 4/00; C07C 143/44
U.S. Cl. 526—205 **5 Claims**

1. Curable compositions, comprising cationically-sensitive monomers and a catalytically effective amount of acidic cyclic perfluoroaliphaticdisulfonimides or their salts comprising compounds of the formula:



wherein R_f is perfluoroalkylene having 2 to 4 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, R_f optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with R_f having a total of up to 14 carbon atoms; M is a cation with a valence equal to n; and n is an integer with a value of 1 to 5.

2. Curable compositions according to claim 1, wherein said cationically-sensitive monomer is selected from the group consisting of 1,2-, 1,3-, and 1,4-cyclic ethers, vinyl ethers, N-vinyl compounds, ethylenically unsaturated hydrocarbons, cyclic formals, and cyclic organosiloxanes.

4,429,094

OPTICALLY TRANSPARENT RADIATION SHIELDING MATERIAL

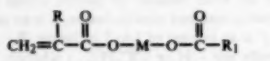
Arthur A. Massucco, Natick, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 6, 1981, Ser. No. 251,504

Int. Cl.[3] **C08F** *120/18, 4/06;* **E04B** *1/12*

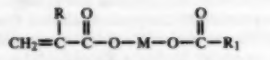
U.S. Cl. 526—240 **17 Claims**

1. An optically transparent organometallic homopolymer prepared from a polyvalent metal salt-containing monomer of the formula

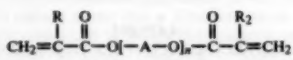


wherein M is a polyvalent metal, R is C_1–C_{12} alkyl, R_1 is C_1 to C_{12} alkyl, phenyl or naphthyl unsubstituted or substituted with C_1 to C_6 alkyl, C_1 to C_6 alkoxy, amino, C_1 to C_4 alkylamino, di C_1 to C_4 alkylamino, nitro or halo or heterocyclic aryl, the heteroatom selected from the group nitrogen, oxygen and sulfur.

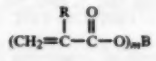
6. An optically transparent organometallic polymer prepared from a polyvalent salt-containing monomer of the formula



where M is a polyvalent metal, R is C_1 to C_{12} alkyl, R_1 is C_1 to C_{12} alkyl, phenyl or naphthyl, unsubstituted or substituted with C_1 to C_6 alkyl, C_1 to C_6 alkoxy, amino, C_1 to C_4 alkylamino, di C_1 to C_4 alkylamino, nitro or halo or heterocyclic aryl, the heteroactom selected from the group nitrogen, oxygen and sulfur; and at least one polyfunctional monomer selected from the group



where R_2 is hydrogen or methyl, A is alkylene of 2 to 4 carbon atoms and n is integer of 2 to 60 inclusive and



where R_2 is as previously defined, B is a saturated or unsaturated hydrocarbon residue of 4–24 carbon atoms and m is an integer of 2 to 4 inclusive.

4,429,095

POLYMERIZABLE COMPOSITIONS COMPRISING DERIVATIVES OF MONO-(ALKYLENE UREIDO ALKYL) UREAS AND BIS-(ALKYLENE UREIDO ALKYL) UREAS

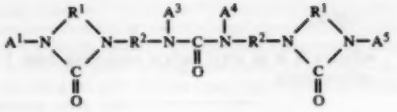
Joseph M. Sandri, Arnold; John W. Calentine, Pasadena; Seymour M. Linder, and Yves J. Billioux, both of Baltimore, all of Md., assignors to Alcolac Inc., Baltimore, Md.

Division of Ser. No. 163,488, Jun. 27, 1980, Pat. No. 4,340,743, which is a continuation-in-part of Ser. No. 157,238, Jun. 6, 1980, Pat. No. 4,319,032. This application Feb. 25, 1982, Ser. No. 352,206

Int. Cl.[3] **C08F** *26/06*

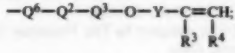
U.S. Cl. 526—263 **13 Claims**

1. A composition suitable for use in forming aqueous emulsion polymers comprising a polymerizable mixture of at least one unsaturated monomer polymerizable to form a latex polymer for paint and at least one compound having the formula:

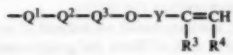


where

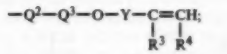
A^1 and A^5 are each independently H, Q^6H, or



A^3 and A^4 are each independently H, Q^1H, or



provided that at least one of A^1, A^3, A^4 and A^5 is a group having the moiety



R^1 is alkylene having 2 to 3 carbon atoms;

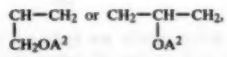
R^2 is alkylene having 2 to about 10 carbon atoms;

R^3 is H or CH_3;

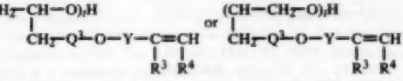
R^4 is H or CH_3 and may be the same as or different from R^3;

Q^1 is $(R^5—O)_m$ where m is zero or an integer from 1 to about 100, and R^5 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxyalkylene residue having 2 to about 20 carbon atoms;

Q^2 is



where A^2 is H,



where t is zero or an integer from 1 to 10;

Q^3 is $(O—R^6)_n$ where n is zero or an integer from 1 to about 100 and may be the same as or different from m, and R^6 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene or aryloxyalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5;

Q^6 is $(R^9—O)_r$ where r is zero or an integer from 1 to about 100 and may be the same as or different from m and n and R^9 is a linear or branched alkylene, alkoxyalkylene, cycloalkylene, cycloalkoxyalkylene, arylalkylene, or aryloxyalkylene residue having 2 to about 20 carbon atoms, and may be the same as or different from R^5 and R^6; and

Y is CH_2 or

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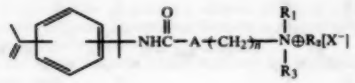
QUATERNARY AMINE CARBAMATE OR UREA COMPOUNDS BASED ON ISOPROPENYL-α,α-DIMETHYLBENZYL ISOCYANATE

Frederic C. Schaefer, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 500,068
Int. Cl.³ C08F 212/14, 220/56
U.S. Cl. 526—287 8 Claims

1. A meta- or para-compound of the formula;



wherein:

X^- is an anion selected from the group consisting of $R_4OSO_3^\ominus$, $Cl^\ominus$, $Br^\ominus$and $I^\ominus$;

A is —O— or

wherein:

n is 2 or 3;

R_1, R_2 and R_3 which may be the same or different, are lower alkyl; and R_4 is lower alkyl or allyl.

8. A copolymer of the compound of claim 1 and acrylamide.

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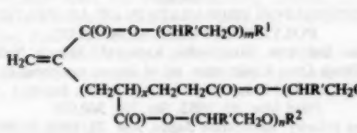
ALKYL POLY(OXYALKYLENE) ESTERS OF ACRYLATE OLIGOMERS AND COPOLYMERS THEREOF FOR THICKENING PURPOSES

Ching-Jen Chang, Chalfont, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 16, 1982, Ser. No. 418,854
Int. Cl.³ C08L 31/06; C08F 18/11
U.S. Cl. 526—317 27 Claims

1. A compound having the formula



wherein

R^1, R^2, and R^3, independently, are selected from the group consisting of hydrogen and alkyl, alkylaryl and polycyclic alkyl groups having 1 to 30 carbon atoms;

m, n, and p, independently, are zero or a number having an average value of up to 60 or more, provided that at least one of m, n, or p is at least 2 and provided that the R^1, R^2, or R^3 group, when m, n, or p, respectively, is at least 2, is one of said alkyl, alkylaryl and polycyclic alkyl groups having at least 8 carbon atoms;

x is zero or an integer from 1 to 5;

R′ is selected from the group consisting of hydrogen and C_1–C_2 alkyl; and

the expressions $(CHR'CH_2O)_m$, $(CHR'CH_2O)_n$ and $(CHR'CH_2O)_p$, mean that the groups $(CHR'CH_2O)_m$, $(CHR'CH_2O)_n$, and $(CHR'CH_2O)_p$, respectively, embrace oxyethylene, oxypropylene, and oxybutylene groups arranged in any order.

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MODIFIED CRUDE TOLUENE DIISOCYANATE TO OBTAIN POLYURETHANE WITH AN IMPROVEMENT IN HIGH RESILIENCY

Jean Bertrand, Lamorlaye, and Michel Gaillard, Chantilly, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Aug. 30, 1982, Ser. No. 412,730
Claims priority, application France, Sep. 25, 1981, 81 18075
Int. Cl.³ C08G 18/10
U.S. Cl. 528—59 10 Claims

1. The method of making a modified crude toluene diisocyanate comprising first reacting a crude toluene diisocyanate with a polyol in an amount such that the isocyanate concentration of the crude toluene diisocyanate is lowered at most up to about 2 —NCO groups per kilogram of crude toluene diisocyanate and then subjecting such reaction product to a temperature and for a time sufficient that the isocyanate concentration of such reaction product is lowered no more than about 0.4 —NCO groups per kilogram of reaction product.

10. A modified crude toluene diisocyanate in the form of a prepolymer having an isocyanate concentration between about 6.6 to 10.6 —NCO groups per kilogram and being the reaction product obtained by first reacting a crude toluene diisocyanate having an isocyanate concentration of about 9 to 11 NCO grouups per kilogram selected from (1) a mixture of at least one pure toluene diisocyanate and high molecular weight products resulting from the phosgenation of at least one toluene diamine or at least one toluene diamine hydrochloride, or (2) crude toluene diisocyanate obtained directly from phosgenation of at least one toluene diamine or at least one toluene diamine hydrochloride, with a polyol having a functionality of about 2 to 8 hydroxyl groups and an equivalent molecular weight of about 30 to 1,000, said crude toluene diisocyanate and said polyol being present in an amount such that the isocyanate concentration of said crude toluene diisocyanate is lowered at most up to about 2 —NCO groups per kilogram of crude toluene diisocyanate, and then subjecting such reaction product to aging at a temperature of from about 50° to 110° C. for a period of from about some hours to several days such that the isocyanate concentration of such reaction product is lowered no more than about 0.4 —NCO groups per kilogram of reaction product.

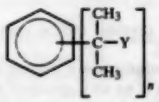
4,429,099

PHENOL TERMINATED POLYMERS AND EPOXIES THEREFROM

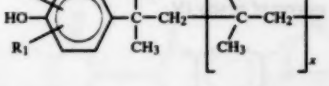
Joseph P. Kennedy, and Suhas Guhaniyogi, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio

Filed Nov. 22, 1982, Ser. No. 443,346
Int. Cl.³ C08G 59/24, 59/32; C08F 8/08
U.S. Cl. 528—98 10 Claims

1. A telechelic prepolymer, comprising:



where n is 2 or 3 and Y is



wherein R_1 and R_2 may be the same or different and are selected from the group consisting of —H, —OH, and —CH_3 and x is a positive integer.

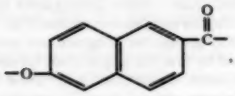
4,429,100
POLYESTER OF 6-HYDROXY-2-NAPHTHOIC ACID, PARA-HYDROXYBENZOIC ACID, 2,6-DIOXYANTHRAQUINONE, AND AROMATIC DIACID

Larry F. Charbonneau, Chatham, and Gordon W. Calundann, North Plainfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,271
Int. Cl.³ C08G 63/60
U.S. Cl. 528—128 **18 Claims**

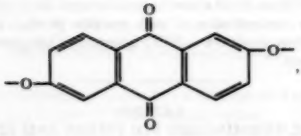
1. A melt processable wholly aromatic polyester capable of forming an anisotropic melt phase at a temperature below approximately 260° C. consisting essentially of the recurring moieties I, II, III, and IV which may include substitution of at least some of the hydrogen atoms present upon an aromatic ring wherein:

I is



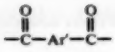
II is

III is



and

IV is



where Ar' is a divalent radical comprising at least one aromatic ring,

with said optional substitution if present being selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, and mixtures of the foregoing, and wherein said polyester comprises approximately 20 to 45 mole percent of moiety I, approximately 20 to 45 mole percent of moiety II, approximately 7.5 to 25 mole percent of moiety III, and approximately 7.5 to 25 mole percent of moiety IV.

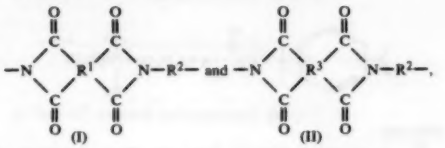
4,429,101
Patent Not Issued For This Number

4,429,102
NOVEL SULFUR-CONTAINING POLYETHERIMIDES

Thomas L. Evans, and Marsha M. Grade, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 10, 1983, Ser. No. 457,090
Int. Cl.³ C08G 73/10
U.S. Cl. 528—172 **10 Claims**

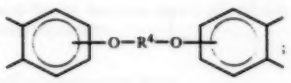
1. A polyetherimide consisting essentially of chemically combined units having the formulas



(I) (II)

wherein:

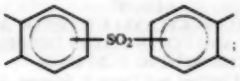
R^1 is



(III)

R^2 is an aromatic hydrocarbon radical containing about 6–20 carbon atoms or a halogenated derivative thereof, an alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or a bis-alkylenepoly(dialkylsiloxane) radical;

R^3 is



(IV)

and

R^4 is a divalent radical derived from benzene or a substituted benzene, diphenyl or a substituted diphenyl, or an unsubstituted or substituted diphenylalkane.

4,429,103
METHOD FOR PREPARATION OF AROMATIC POLYESTER-POLYCARBONATE

Katsuhisa Kohyama, Kitakyushu; Katsuyuki Sakata, Nakama, and Shinji Ono, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 360,000
Claims priority, application Japan, Apr. 21, 1981, 56-60225
Int. Cl.³ C08G 63/64
U.S. Cl. 528—176 **8 Claims**

1. In a method for preparing an aromatic polyesterpolycarbonate containing dihydroxy-diaryl compound residues, terephthalic acid and/or isophthalic acid residues and carbonate groups in a molar ratio of 1:0.25–0.75:0.75–0.25 by the interfacial polymerization method, the improvement comprising:

mixing and reacting an aqueous alkaline solution of a dihydroxy-diaryl compound, an organic solvent solution of terephthaloyl chloride and/or isophthaloyl chloride and phosgene thereby obtaining a polyesterpolycarbonate oligomer containing —OCOCl, —COCl and —OH end groups, the molar ratio of said —OH groups to the sum of said —OCOCl and —COCl groups being not greater than 1 and the molar ratio of said —COCl groups to said —OCOCl groups being no more than 2.5; and

polycondensing said oligomer in a solution of a caustic alkali, said oligomer containing substantially no dihydroxy-diaryl compound.

4,429,104

PREPRATION OF SHAPED ARTICLES OF INTRACTABLE POLYMERS

Ronald G. Feasey, Knebworth, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 58,541, Jul. 17, 1977, abandoned. This application Mar. 26, 1982, Ser. No. 362,106

Claims priority, application United Kingdom, Jul. 31, 1978, 31771/78

Int. Cl.³ C08G 63/46, 63/06

U.S. Cl. 528—206 5 Claims

1. A process for preparing a shaped article of a normally intractable polymer comprising forming a shaped article of a melt processable copolymer comprising:

(1) the recurring units which make up the intractable polymer and

(2) labile in-chain polymer recurring units, heating the copolymer article under conditions such that the labile units are removed from the copolymer and the remaining units combine to form an intractable polymer wherein the integrity of the shaped article is maintained.

4,429,105

PROCESS FOR PREPARING A POLYESTER OF HYDROXY NAPHTHOIC ACID AND HYDROXY BENZOIC ACID

Larry F. Charbonneau, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,240

Int. Cl.³ C08G 63/08, 63/10

U.S. Cl. 528—207 15 Claims

1. A process for preparing an aromatic polyester comprising reacting at least one hydroxy naphthoic acid and at least one hydroxy benzoic acid with an esterification agent under reaction conditions sufficient to esterify the hydroxy moieties of the hydroxy benzoic acid and hydroxy naphthoic acid, and polymerizing the esterified monomers without separation thereof prior to polymerization, with both the esterification and polymerization being conducted in the presence of from about 5 to about 50 ppm of iron.

4,429,106

METHOD OF PRODUCING POLYPHENYLENE OXIDES USING MORPHOLINIUM BROMIDE AS ACTIVATOR

Klaus Burzin, Marl; Martin Bartmann, Recklinghausen; Hanns-Jorg Bax, Marl, and Wilfried Ribbing, Dorsten, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

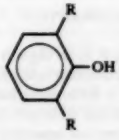
Filed May 23, 1983, Ser. No. 497,237

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224692

Int. Cl.³ C08G 65/44

U.S. Cl. 528—216 11 Claims

1. A method of producing a high molecular-weight polyphenylene oxide, having a relative viscosity change in relation to the concentration greater than 50 ml/g, measured in a 0.5% solution in chloroform at 25° C., comprising the oxidative coupling of a diortho-substituted phenol having the formula:



wherein R is an n-alkyl radical with 1 to 6 carbon atoms or an aryl radical, in the presence of an oxidizing agent, an organic solvent, a copper-amine catalyst, which comprises a copper salt and an amine, and an activator, which comprises morpholinium bromide and a 20 to 60% solution or suspension of an alkali or alkaline earth hydroxide, in a temperature range of 20° to 80° C., wherein X moles of alkali or alkaline earth hydroxide, and y moles of morpholinium bromide are used per 100 moles of said phenol, wherein $1<x<25$, $0.1<y<20$, and $y<x$.

4,429,107

CONTINUOUS PREPARATION OF POLYCAPROLACTAM WHEREIN CONSTANT COMPOSITION IS MAINTAINED

Hugo Strehler, Frankenthal; Werner Hoerauf; Guenter Valentin, both of Ludwigshafen, and Friedrich Urbanek, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 410,880

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134716

Int. Cl.³ C08G 69/16

U.S. Cl. 528—318 2 Claims

1. An improved process for the continuous polymerization of ε-caprolactam which comprises:

polymerizing partially an ε-caprolactam composition at a nylon-forming temperature, in a mechanical mixing zone in a vertical tubular reactor through which the caprolactam composition flows downwardly, said composition comprising ε-caprolactam, a water-containing agent, and acetic acid or propionic acid as chain regulator;

polymerizing further said composition in additional heat exchange zones in said reactor until polymerization is completed and thereupon discharging polycaprolactam from the reactor as a melt;

removing from the tubular reactor a vapor mixture of water, caprolactam, and acetic acid or propionic acid which has formed in the gas space at the top of the tubular reactor;

feeding the vapor mixture of caprolactam, water, and acetic acid or propionic acid to the middle of a fractionating column;

removing water from the top of said column;

maintaining the temperature at the bottom of said column at 125° C. to 145° C.; and

recycling the mixture obtained at the bottom of the column to the top of the tubular reactor, said mixture comprising caprolactam, acetic acid or propionic acid, and a small amount of water;

whereby the polymerizing caprolactam composition and polycaprolactam melt maintain a constant composition.

4,429,108

POLY[N,N'-(ALKYL OR ARYL)-BIS(4,4'-PHTHALIMIDO)-1,3,4-OXADIAZOLE-2,5-DIYLS]

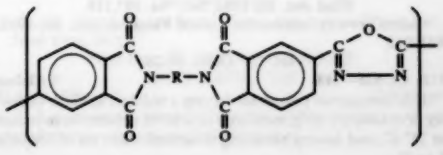
James R. Stephens, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 424,606

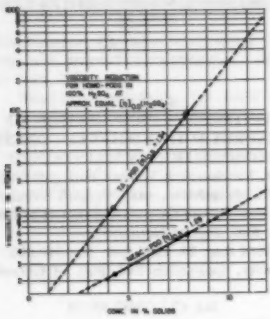
Int. Cl.³ C08G 73/08, 73/10

U.S. Cl. 528—322 35 Claims

1. A fiber forming polyimido oxadiazole comprising the recurring structure:



wherein R is a divalent aliphatic hydrocarbon radical.

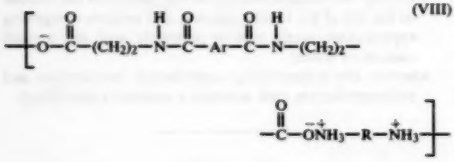


4,429,109
POLYAMIDES WITH HIGH GLASS TRANSITION TEMPERATURES PREPARED FROM N,N'-TEREPHTHALOYLDI-BETA-ALANINE AND A DIAMINE

Benedict S. Curatolo, Maple Heights, and Gerald P. Coffey, Lyndhurst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Sep. 15, 1982, Ser. No. 418,334
Int. Cl.³ C08G *69/08, 69/26, 69/36*
U.S. Cl. 528—331 **7 Claims**

1. A water insoluble polyamide containing zero to about 50 mole % nylon-3 units in at least a partially alternating structure, exhibiting glass transition temperatures greater than 130° C. and derived by condensation polymerization of a nylon salt of the formula:



(VIII)

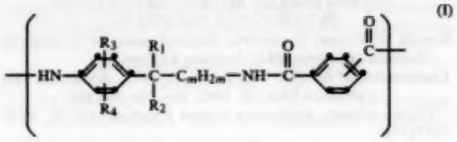
where R is any aliphatic, aromatic or alicyclic divalent radical.

4,429,110
TRANSPARENT POLYAMIDE FROM BRANCHED CHAIN ARYLALKYL DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

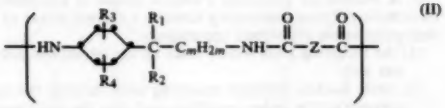
Filed Jun. 10, 1982, Ser. No. 387,119
Claims priority, application United Kingdom, Jun. 19, 1981, 8119012
Int. Cl.³ C08G *69/26*
U.S. Cl. 528—348 **8 Claims**

1. A transparent polyamide having a reduced specific viscosity of at least 0.3 dl/g, measured on a 0.5% solution in m-cresol at 25° C., and having recurring structural elements of formula I or II



(I)

or



(II)

wherein

$-C_mH_{2m}-$ is a straight or branched chain alkylene where m is an integer of from 4 to 16,

R_1 is C_{1-3} alkyl,

R_2 is C_{1-6} alkyl,

R_3 and R_4 independently of each other are hydrogen or C_{1-3} alkyl, and

Z is 50 to 100 mole percent 1,3-phenylene, 1,4-phenylene, or mixture thereof, and 0 to 50 mole percent $-(CH_2)_n-$ wherein n is an integer of from 4 to 10, and whereby the carbonyl groups in the structural elements of formula I are linked to the benzene ring in the 1,3-position, 1,4-position or in mixture thereof.

4,429,111
LAYERED ORGANOPHOSPHORUS INORGANIC POLYMERS CONTAINING MIXED FUNCTIONAL GROUPS

Martin B. Dines, Santa Ana, and Peter M. DiGiacomo, Mission Viejo, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 60,250, Jul. 24, 1979, which is a continuation-in-part of Ser. No. 945,971, Sep. 26, 1978, Pat. No. 4,232,146. This application May 29, 1981, Ser. No. 268,408
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.³ C08G *79/04, 79/00*
U.S. Cl. 528—395 **33 Claims**

1. A process for the production of phosphorus-containing organo-substituted inorganic polymers containing multi-component derivatized groups, which comprises reacting

(a) at least one species of tetravalent metal ion in a liquid medium with at least two members selected from phosphoric acid, phosphonic acid and organophosphorus acids of the formula:

$$[(HO)_2OP]_nR \text{ and } [(HO)_2OPO]_nR$$

wherein n is 1 or 2 and R is an organo group covalently coupled to phosphorus and wherein when n is 2, R contains at least two carbon atoms and is directly or indirectly coupled to the phosphorus atoms through different carbon atoms whereby the two phosphorus atoms are separated by at least two carbon atoms, and

(b) causing precipitation from the liquid medium of a solid inorganic polymer in which the molar ratio of phosphorus to tetravalent metal is about 2 to 1 and in which the organo group is covalently bonded to phosphorus and phosphorus is linked to the tetravalent metal through oxygen.

4,429,112
PROCESS OF DELAYING CURE OF CURABLE RESIN COMPOSITION CONTAINING CYANATE ESTER COMPOUND WITH BENZENE SULFONIC ACID COMPOUND

Morio Gaku, Showamachi; Syunichi Nagai; Hidenori Kimpara, both of Tokyo, and Satoshi Ayano, Kanagawa, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,975
Claims priority, application Japan, Jun. 2, 1981, 56-84830; Jun. 5, 1981, 56-86370; Jun. 5, 1981, 56-86371
Int. Cl.³ C08G 85/00
U.S. Cl. 528—422 7 Claims

1. A method for delaying curing rate of a curable resin composition comprising:

(a) at least one cyanate ester compound selected from the group consisting of

(1) a polyfunctional aromatic cyanate ester monomer having the formula

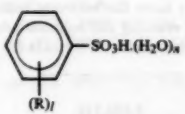
$$R—OCN)_m$$

wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a homoprepolymer of one or more cyanate esters of (1),

(3) a coprepolymer of (1) and an amine, characterized in that

at least one alkyl substituted or non-substituted benzene sulfonic acid represented by the formula



(1)

wherein R is alkyl having 1–3 carbon atoms, l is 0 or integer of 1–3 and n is 0 or integer of 1–4 in an amount of 0.0001–5% by weight on the basis of total weight of the composition is added to said composition.

4,429,113
FRACTIONATION OF POLYMERS

Stephen H. Wu, and Clarence C. Dannelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 45,580, Jun. 4, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 229,032
Int. Cl.³ C08F 6/00, 6/04
U.S. Cl. 528—486 3 Claims

1. The process of obtaining a high molecular weight fraction from a polymer which comprises the steps of

(a) forming a solution of the polar polymer in a solvent which is also a solvent for a selected coacervating substance,

(b) mixing with said solution a coacervating polymer having at least two proton donating or proton receiving groups which are opposite the polarity of said polar polymer in an amount sufficient to crosslink molecules of said polar polymer of a molecular weight above a selected range at the solution temperature, said coacervating substance being a polyfunctional acid or base having the formula

$$(X_1)_m—Q—(X_2)_n$$

wherein X_1 and X_2 represent proton-donating or proton-receiving groups, Q is an organic moiety, and m and n are the multiplicity of the acidic or basic group, thereby forming coacervated high molecular weight polymer solids, and

(c) separating the high molecular weight solids from the solution.

4,429,114
METHOD FOR TREATING EMULSIFIED LATEX

Teruhiko Sugimori, and Hideaki Habara, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,331
Claims priority, application Japan, May 15, 1981, 56-73115
Int. Cl.³ C08F 6/22
U.S. Cl. 528—486 14 Claims

1. A method for producing a particulate of a high bulk specific gravity containing substantially no finely powdered material nor a coarse powdered material from an emulsified latex, which comprises:

discharging an emulsified latex having a Reynolds number of 300 or less containing particles of 1 μm or less in diameter from fine tubes which satisfy the relationship: $L/D \geq 0.065$ Re, wherein L is the length of the fine tubes, D is the equivalent diameter of the fine tubes and Re is the Reynolds number into a coagulation solution to coagulate the latex; and

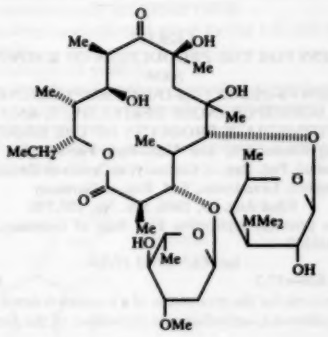
washing and drying the coagulated latex.

4,429,115
3-O-OLEANDROSYL-5-O-DESOSAMINYL ERYTHRONOLIDE COMPOUNDS

Leonardo M. Cappelletti, Fayetteville, N.Y.; Roberto Spagnoli, and Luciano Toscano, both of Milan, Italy, assignors to Pierrel S.p.A., Naples, Italy

Filed Jan. 8, 1982, Ser. No. 338,117
Claims priority, application Italy, Jan. 9, 1981, 19081 A/81
Int. Cl.³ A61K 31/71; C07H 17/08; C12P 19/62
U.S. Cl. 536—7.2 4 Claims

1. 3-O-oleandrosyl-5-O-desosaminyl-(8S)-8-hydroxyerythronolide B, having the formula

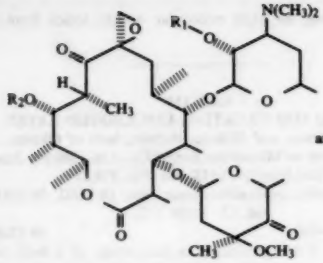


4,429,116
ALKYLATED OLEANDOMYCIN CONTAINING COMPOUNDS

Arthur A. Nagel, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

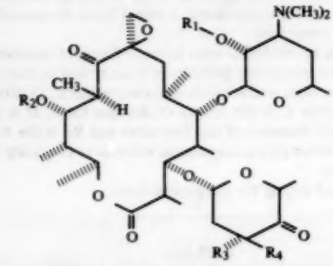
Filed Dec. 27, 1982, Ser. No. 453,255
Int. Cl.³ C07H 17/08
U.S. Cl. 536—7.2 21 Claims

1. A compound selected from the group consisting of an oleandomycin derivative of the formulae:



(I)

and



(II)

and a pharmaceutically acceptable acid addition salt thereof wherein

R_1 is selected from the group consisting of hydrogen and alkanoyl having two to three carbon atoms;

R_2 is trimethylsilyl;

R_3 is selected from the group consisting of hydrogen, methyl, allyl and methoxy; and

R_4 is selected from the group consisting of methoxy and allyl;

with the proviso that when R_4 is allyl, R_3 is methoxy.

4,429,117

PROCESS FOR THE PRODUCTION OF KNOWN AND NEW 6-AMINO-6-DESOXY-2,3-O-ISOPROPYLIDENE-α-L-SORBOFURANOSE DERIVATIVES, AND INTERMEDIATE PRODUCTS OF THE PROCESS

Wolfgang Koebernick, and Hans-Rolf Furtwängler, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

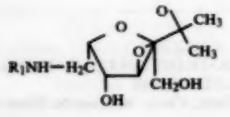
Filed Aug. 25, 1980, Ser. No. 180,778

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936240

Int. Cl.³ C07H *17/04*

U.S. Cl. 536—17.2 **5 Claims**

1. A process for the production of a 6-amino-6-desoxy-2,3-O-isopropyidine-α-L-sorbofuranose derivative of the formula

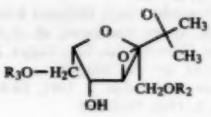


(I)

in which

R_1 denotes a hydrogen atom or a C_1–C_{18}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkinyl or C_2–C_{10}-alkadienyl radical said C_1–C_{18}-alkyl radical being optionally substituted by hydroxyl, C_1–C_4-alkoxy, C_1–C_7-alkanoyloxy, benzoyloxy, mercapto, C_1–C_4-alkylthio, halogen, nitro, amino, C_1–C_4-alkylamino or C_1–C_6-alkylcarbonylamino,

which comprises heating a compound of the formula



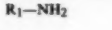
(II)

in which

R_2 denotes a hydrogen atom or an acyl radical and

R_3 denotes a radical of an aliphatic or aromatic sulphonic acid,

with an amine of the formula

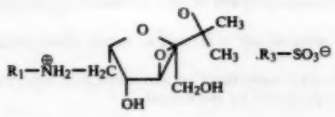


(III)

in which

R_1 has the abovementioned meaning,

in an aqueous medium in an autoclave, isolating the reaction product of the formula



(V)

in which R_1 and R_3 have the meaning indicated above, in crystalline form and reacting the reaction product in a basic medium to give the free amine of formula (I).

4,429,118

METHYL 3-AZIDO-4-C-CYANO-2,3,4,6-TETRADEOXY-α-D-ARABINO-HEXOPYRANOSIDE AND PROCESSES FOR ITS PREPARATION

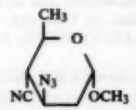
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 248,178, Mar. 30, 1981, Pat. No. 4,348,325. This application May 3, 1982, Ser. No. 374,574

Int. Cl.³ C07H *15/04*

U.S. Cl. 536—17.2 **2 Claims**

1. The compound having the structure:



which is methyl 3-azido-4-C-cyano-2,3,4,6-tetradeoxy-α-D-arabino-hexopyranoside.

4,429,119

5-DEOXY-3-O-ARYLMETHYL OR SUBSTITUTED ARYLMETHYL-1, 2-O-ALKYLIDENE-ALPHA-D-XYLOFURANOSE HERBICIDE DERIVATIVES

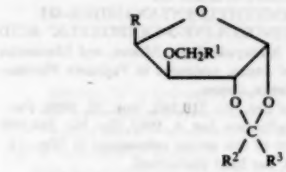
William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 18, 1982, Ser. No. 409,236

Int. Cl.³ C07H *17/04*; A01N *43/08*

U.S. Cl. 536—181 **15 Claims**

1. A compound having the formula:



(I)

wherein

R is lower alkyl having 1 through 4 carbon atoms or alkenyl having 2 through 4 carbon atoms;

R^1 is 2-trifluoromethylphenyl, aryl having 6 through 10 carbon atoms or substituted aryl having 1 through 4 substituents independently selected from the group of lower alkyl having 1 through 4 carbon atoms, lower alkoxy having 1 through 4 carbon atoms, and halo, with the proviso that when R^1 is substituted aryl having more than two halo substituents or is 2,3- or 2,4-dihalophenyl, then R is alkyl; and

R^2 and R^3 are independently hydrogen or lower alkyl with the proviso that when R is methyl, butyl, vinyl, 2-allyl or but-1-enyl, and R^2 and R^3 are each methyl, then R^1 is not phenyl.

4,429,120

ETHYLHYDROXYALKYLMETHYLCELLULOSE ETHERS

Mary K. Dehnke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1982, Ser. No. 454,133

Int. Cl.³ C08B *11/08, 11/193*

U.S. Cl. 536—91 **12 Claims**

1. An organo-soluble ethyl C_{2-4} hydroxyalkylmethylcellulose.

4,429,121

CLARIFIED TAMARIND KERNEL POWDER

Paul A. Sandford, Del Mar, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 151,495, May 19, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,627

Int. Cl.³ A61K *35/78;* **C08B** *37/00*

U.S. Cl. 536—123 **10 Claims**

1. A process for preparing clarified tamarind kernel powder which comprises preparing an aqueous slurry of TKP and a strong alkali, mixing said slurry, then optionally neutralizing said slurry, and isolating said clarified tamarind kernel powder.

4,429,122

SEPARATION OF SACCHARIDES

Joseph J. Zupancic, Bensenville, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 20, 1982, Ser. No. 369,995

Int. Cl.³ C07H *1/06*

U.S. Cl. 536—124 **15 Claims**

1. A process for the continuous separation of a mono- or disaccharide from polysaccharides by passing a mixture of monosaccharide, disaccharide and polysaccharides over an ultra-filtration membrane consisting essentially of a polyurethane or a polyamine composited and cross-linked to a support selected from the group consisting of a polysulfone, polyester, polycarbonate and polyolefin support, wherein said cross-linking is provided by a cross-linking agent selected from the group consisting of a dibasic acid chloride, a tribasic acid chloride, an acid anhydride, an aliphatic diisocyanate, an aliphatic thioisocyanate, an aliphatic chloroformate, an aliphatic sulfonyl chloride, an aromatic diisocyanate, an aromatic thioisocyanate, an aromatic chloroformate and an aromatic sulfonyl chloride, said separation being performed at a temperature in the range of from ambient to 70° C. and a pressure in the range of from 20 to 1000 psig to retain said polysaccharides while permitting said monosaccharides or disaccharides to permeate through said ultrafiltration membrane.

4,429,123

PREPARATION OF 6-KETO-7-OXO-PGF$_{1\alpha}$-DERIVATIVES

Istvan Tomoskozi, Budapest; Istvan Szekely, Dunakeszi; Karoly Kanai, Budapest; Peter Gyori, Budapest, and Gabor Kovacs, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

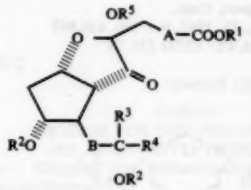
Filed Apr. 13, 1982, Ser. No. 368,016

Claims priority, application Hungary, Apr. 14, 1981, 968

Int. Cl.³ C07D *307/935*

U.S. Cl. 542—426 **6 Claims**

1. A process for the preparation of a compound of Formula I



(I)

wherein

A is a straight or branched chain alkylene group having 1–5 carbon atoms;

B is ethylene, Z or E vinylene, or ethynylene;

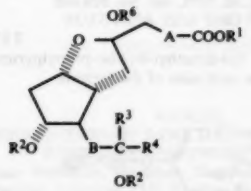
R^1 is hydrogen, an alkyl group having 1–5 carbon atoms or a pharmaceutically acceptable cation;

R^2 is hydrogen, an alkanoyl group having 1–5 carbon atoms or aroyl;

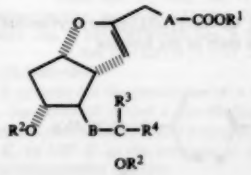
R^3 is hydrogen or methyl;

R^4 is a straight or branched chain alkyl group having 1–8 carbon atoms or an optionally monosubstituted aryloxymethyl group; and

R^5 is hydrogen which comprises oxidizing a compound of the Formula III, IV or V

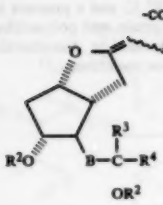


(III)



(IV)

-continued



(IV)

or a mixture thereof wherein R^6 is hydrogen or an alkyl or alkanoyl group having 1–5 carbon atoms with selenium dioxide to yield the compound of the formula (I).

4,429,124

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

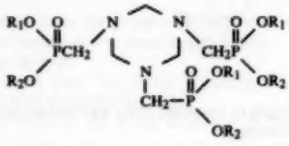
Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 23, 1982, Ser. No. 410,802

Int. Cl.³ C07D *251/04*

U.S. Cl. 544—214 **2 Claims**

1. A compound of the formula



wherein R_1 is C_1–C_6 alkyl and R_2 is C_1–C_6 alkyl.

4,429,125

PHOSPHORUS ESTERS OF 5-PYRIMIDINOLS

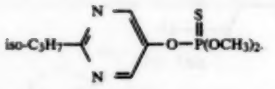
Walter Reifschneider, Walnut Creek, Calif., assignor to The Dow Chemical Co., Midland, Mich.

Filed Jul. 28, 1978, Ser. No. 928,665

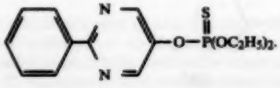
Int. Cl.³ C07F *9/65*; A01N *57/16*

U.S. Cl. 544—243 **2 Claims**

1. The compound 0,0-dimethyl-0-(2-iso-propylpyrimidin(-5)yl)-thionophosphoric acid ester of the formula



2. The compound 0,0-diethyl-0-(2-phenylpyrimidin(5)yl)-thionophosphoric acid ester of the formula



4,429,126

SODIUM SALT OF 4-OXO-10-(2,3-DIMETHYLPENTANAMIDO)-4H-PYRIMIDO[1,2-c]QUINOZOLINE-3-CARBOXYLIC ACID

Ikuo Ueda, Toyonaka; Masayuki Kato, Minoo, and Masanobu Nagano, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 210,340, Nov. 25, 1980, Pat. No. 4,377,580. This application Jun. 4, 1982, Ser. No. 384,998

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.³ C07D *487/04, 471/14, 239/80*; A61K *31/505*

U.S. Cl. 544—250 **1 Claim**

1. Sodium 4-oxo-10-(2,3-dimethylpentanamido)-4H-pyrimido[1,2-C]quinazoline-3-carboxylate.

4,429,127

QUINOLINE CARBOXYLIC ACID DERIVATIVE

Tsutomu Irikura, Tokyo; Hiroshi Koga, Oomiya, and Akira Ito, Kuki, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

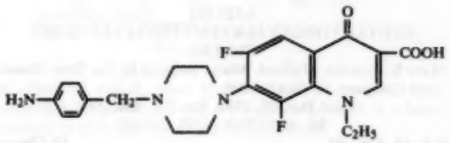
Filed Feb. 17, 1982, Ser. No. 349,660

Claims priority, application Japan, Mar. 6, 1981, 56-32274

Int. Cl.³ C07D *401/04*; A61K *31/495*

U.S. Cl. 544—363 **1 Claim**

1. A compound having the following formula



and a pharmaceutically acceptable salt thereof.

4,429,128

CARBAPENAMS AND CARBAPEN-2-EMS AND PROCESS THEREFOR

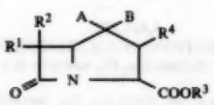
Robert L. Rosati, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 232,156, Feb. 9, 1981, Pat. No. 4,348,264, which is a continuation-in-part of Ser. No. 149,604, May 14, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,853

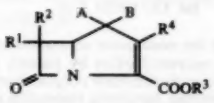
Int. Cl.³ C07D *487/04*

U.S. Cl. 544—373 **29 Claims**

1. A compound of the formulae



(I)



(II)

wherein

R^1 is hydrogen;

phenoxyacetamido;

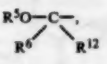
D-2-(4-ethyl-2,3-dioxopiperazine-1-carboxamido)-2-phenylacetamido;

D-2-amino-2-phenylacetamido;

D-2-benzyloxycarbonylamino-2-phenylacetamido;

2-carboxy-2-phenylacetamido, or the benzhydryl, benzyl or 2-naphthylmethyl ester thereof;

5-methyl-3-phenylisoxazole-4-carboxamido; or



wherein R^5 is hydrogen, acetyl, benzyloxycarbonyloxy or p-nitrobenzyloxycarbonyl, R^6 is hydrogen or (C_1–C_5)alkyl and R^{12} is hydrogen or methyl;

R^2 is hydrogen or methoxy;

with the proviso that when R^2 is methoxy, R^1 is 2-phenoxyacetamido;

A and B, when taken together, are oxygen;

A and B, when taken separately, are respectively, hydrogen and hydroxy or acetoxy;

R^3 is hydrogen, or a conventional carboxy protecting group which is selectively removable by hydrogenolysis, selectively removable by mild zinc reduction or selectively hydrolyzable under physiological conditions; and

R^4 is methyl, acetoxymethyl, methanesulfonyloxy, OR or SR, wherein R is (C_1–C_3)alkyl, 2-benzyloxycarbonylaminoethyl, 2-(p-nitrobenzyloxycarbonylamino)ethyl, 2-acetamidoethyl, 2-aminoethyl or 2-amidinoethyl;

with the proviso that when R^4 is other than methyl, the compound is of the formula (II);

the pharmaceutically-acceptable cationic salts when the compound has a carboxylic acid function; or the pharmaceutically-acceptable acid addition salts when the compound has an amino or amidino function.

4,429,129

1α-ETHYL-1β-(2'-ALKOXY CARBONYL-2'-HYDROXYIMINOETHYL)-10-METHOXY 1,2,3,4,6,7,12,12β-OCTAHYDROINDOLO(2,3a)QUINOLIZINES

Csaba Szantay; Lajos Szabo; György Kalaus; Tibor Keve; Lajos Dancsi, all of Budapest; Janos Galambos, Erd; Ferenc Vezekenyi, and Tibor Acs, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

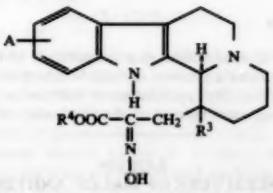
Filed Aug. 20, 1982, Ser. No. 410,052

Claims priority, application Hungary, Aug. 23, 1982, 2436/81

Int. Cl.³ C07D *459/00*

U.S. Cl. 546—70 **4 Claims**

1. A compound of the formula VIII



wherein

A is halogen or a group R^1O- in which

R^1 is C_1 to C_6 alkyl, and R^3 and R^4 are each independently C_1 to C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4,429,130

PYRID-2'-YL-2-TRIFLUOROMETHYL QUINOL-4-YLMETHANES

Eckhard Hickmann, Darmstadt-Schauernheim, and Heinz-Guenter Oeser, Dirmstein, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

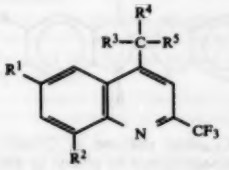
Filed Sep. 25, 1981, Ser. No. 305,858

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 30385047

Int. Cl.³ C07D *401/06*

U.S. Cl. 546—167 **3 Claims**

1. A compound of the formula I



I

where R^1 is hydrogen or chlorine, R^2 is trifluoromethyl or chlorine, R^3 is 2-pyridyl, R^4 is cyano and R^5 is hydrogen.

4,429,131

PROCESS FOR THE PRODUCTION OF 3,5-DIALKYLPYRIDINES

James I. Grayson, Visp, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed Jul. 7, 1982, Ser. No. 396,102

Claims priority, application Switzerland, Jul. 9, 1981, 4504/81

Int. Cl.³ C07D *213/09*

U.S. Cl. 546—251 **20 Claims**

1. Process for the production of a 3,5-dialkylpyridine comprising reacting, in mixture form, (a) an aldehyde having the formula R—CH_2—CHO, wherein R is a straight-chained or branched alkyl radical having 1 to 6 carbon atoms, and/or an aldehyde acetal of said aldehyde with (b) formaldehyde and/or hexamethylene tetramine and/or a formaldehyde acetal and/or a polymer of formaldehyde in liquid or aqueous phase at a temperature of 180° to 280° C. in a closed vessel in the presence of ammonia and/or ammonium ions and in the presence of anions of a inorganic acid and/or an organic acid, both of which 20° C. have an acid dissociation constant of 10^{-6} to 10^{-12}.

4,429,132

PRODUCTION OF 3-TRICHLOROMETHYL- AND 3-TRIFLUOROMETHYL-PYRIDINES

Graham Whittaker, Frodsham, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Apr. 27, 1982, Ser. No. 372,372

Claims priority, application United Kingdom, May 13, 1981, 8114624; Jul. 7, 1981, 8120992; Sep. 3, 1981, 8126746

Int. Cl.³ C07D *213/61, 213/26*

U.S. Cl. 546—346 **9 Claims**

1. A process for the production of a 3-trichloromethylpyridine, characterised in that a 3-methylpyridine is reacted with chlorine in the vapour phase at a temperature in the range from 200° C. to 350° C. in the presence of a metal oxide or metal halide halogenation catalyst.

4,429,133
2'-BENZOTHIAZOLYL-AND 2'-BENZOXAZOLYL-2-BENZIMIDAZOLES

Peter S. Littlewood, Menston, England, assignor to Sandoz Ltd., Basel, Switzerland

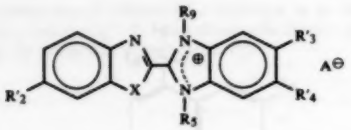
Filed Jul. 28, 1977, Ser. No. 819,937

Claims priority, application United Kingdom, Aug. 4, 1976, 32457/76; Feb. 25, 1977, 7982/77

Int. Cl.³ C07D *413/04, 417/04*

U.S. Cl. 548—159 **29 Claims**

1. A compound of the formula



where R_2' is C_{1-4}alkyl; chlorine; or C_{1-4}alkoxy, unsubstituted or mono-substituted by phenyl or alkoxy(C_{1-4})carbonyl,

one of R_3' and R_4' is hydrogen and the other is hydrogen, or methyl,

R_5 is C_{1-4}alkyl, unsubstituted or mono-substituted by hydroxy, cyano, phenyl, C_{2-4}alkenyl, carboxy, C_{1-4}alkoxycarbonyl or $—CONR_6R_7$; or unsubstituted phenyl,

R_6 and R_7, independently, are hydrogen or C_{1-4}alkyl,

R_9 is C_{1-4}alkyl, unsubstituted or mono-substituted by alkoxy(C_{1-2})carbonyl, phenyl or $—CONR_6R_7$,

X is O or S

and $A^{\ominus}$ is a non-chromophoric anion.

4,429,134
PROCESS FOR THE MANUFACTURE OF 2(3H)-BENZOTHIAZOLONES SUBSTITUTED IN 3-POSITION

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

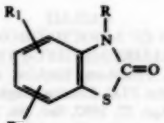
Filed May 18, 1981, Ser. No. 264,228

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018668

Int. Cl.³ C07D *277/68, 277/84, 497/02*

U.S. Cl. 548—165 **4 Claims**

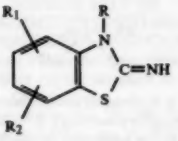
1. A process for the manufacture of a 2-benzothiazolone compound of formula



in which

R_1 and R_2 are identical or different and each is hydrogen, alkyl, or halogen, and R is unsubstituted alkyl having from 1 to 5 carbon atoms,

which comprises reacting, at a temperature within the range of 80°–200° C., a 2-imino-benzothiazoline compound of formula



in which R, R_1 and R_2 are as defined above, with an alkali metal hydroxide or alkaline earth metal hydroxide in a substantially anhydrous solvent or diluent medium stable to alkalis, said substantially anhydrous medium containing less than about 2.5% by weight of water, and the cyclizing the alkali metal or alkaline earth metal salt of the ortho-mercapto-N-phenyl urea compound so formed by reaction with an acid at a temperature of from 40° to 100° C.

4,429,135
PROCESS FOR THE PRODUCTION OF 1,2,4-TRIAZOLIDINE-3,5-DIONES MONOSUBSTITUTED IN THE 4-POSITION

Henning Giesecke, Cologne; Rudolf Merten, Leverkusen, and Ludwig Rottmaier, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

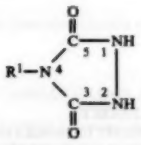
Filed Jun. 29, 1981, Ser. No. 278,654

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027612

Int. Cl.³ C07D *249/12*

U.S. Cl. 548—264 **4 Claims**

1. A process for the production of a 1,2,4-triazolidine-3,5-dione of the formula



wherein R^1 is a monofunctional linear or branched aliphatic C_1–C_{30} radical, a monofunctional cycloaliphatic C_5–C_{21} radical, a monofunctional aliphatic-aromatic C_7–C_{17} radical, a monofunctional aromatic C_6–C_{21} radical, one of said radicals substituted by alkoxy carbonyl having from 1 to 4 carbon atoms in the alkoxy group, CN, NO_2, alkylmercapto having from 1 to 4 carbon atoms, dialkylamino having from 1 to 6 carbon atoms in each alkyl moiety or halogen, or one of said aromatic radicals substituted by alkyl having from 1 to 4 carbon atoms, said process comprising reacting 0.9 to 1.1 moles of hydrazodicarbonamide or 1,2,4-triazolidine-3,5-dione with one mole of a primary amine of the formula

R^1NH_2

wherein R^1 is as aforesaid, at a temperature of from 150° to 280° C. and under a pressure of from 50 mbars to 5 bars in the presence of N-methyl pyrrolidone or sulfolan as solvent, said reaction being accompanied by the elimination of ammonia.

4,429,136
MANUFACTURE OF MALEIC ANHYDRIDE

Chelliah Daniel, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 22, 1982, Ser. No. 443,254

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—258 **4 Claims**

1. The process for production of maleic anhydride compris-

ing the oxidation of n-butane, n-butenes, 1,3-butadiene or mixtures thereof with molecular oxygen in the vapor phase at a temperature in the range of from about 360° C. to 500° C. in the presence of a catalyst having the empirical formula $Cu_aP_bMn_cMo_dO_x$ wherein a is 0.001 to 1.0, b is 0.01 to 2.0, c is 0.001 to 2.0, d is 1.0 to 20.0, and x is a number which satisfies the unshared positive valences of the other elements in the formula.

4,429,137

PREPARATION OF MALEIC ANHYDRIDE

Patricia R. Blum, Macedonia; Ernest C. Milberger, Solon; Noel J. Bremer, Stow, and Dennis E. Dria, Shaker Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 220,629, Dec. 29, 1980, Pat. No. 4,361,501. This application Jun. 16, 1982, Ser. No. 388,857

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—259 12 Claims

1. A process for the production of maleic anhydride by the oxidation of n-butane, n-butene, 1,3-butadiene or a mixture thereof with molecular oxygen or oxygen-containing gas in the vapor phase at a reaction temperature of 250° C.–600° C. in the presence of a catalyst containing the mixed oxides of vanadium and phosphorus, wherein said catalyst is prepared by

(a) introducing a pentavalent vanadium-containing compound into a liqud medium, capable of reducing the valence state of said vanadium;

(b) effecting reduction of at least a portion of said vanadium to a valence state of about +4;

(c) adding a mixed phosphorus component comprising 45–90% by weight orthophosphoric acid and 10–50% by weight pyrophosphoric acid to said medium prior to or subsequent to effecting said reduction to form a catalyst precursor;

(d) recovering the catalyst precursor;

(e) drying the catalyst precursor;

(f) calcining the catalyst precursor.

4,429,138

PROCESS FOR THE SYNTHESIS OF 5-METHOXY-PSORALEN

Jean-Jacques Goupil, 30 Avenue du President Wilson, 94230 Cachan, France

Continuation of Ser. No. 953,118, Oct. 20, 1978, abandoned. This application Oct. 9, 1980, Ser. No. 195,414

Claims priority, application France, Oct. 21, 1977, 77 31719; Dec. 9, 1977, 77 37144

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—282 11 Claims

1. A process of synthesizing 5-methoxy psoralene comprising methylating phloroglucinol with methanol to obtain the monomethyl ether of phloroglucinol; cyclizing the phloroglucinol monomethyl ether by first reacting with chloracetonitrile in the presence of gaseous HCl and zinc chloride then heating with postassium acetate to obtain 6-hydroxy-4-methoxy-3-coumaranone; reducing the 6-hydroxy-4-methoxy-3-courmaranone by direct reduction in the presence of a hydrazine hydrate catalyst to obtain 6-hydroxy-4-methoxy coumaran; cylizing the 6-hydroxy-4-methoxy-coumaran by reacting with acrylonitrile in the presence of HCl and zinc chloride to obtain 3,4,4',5'-tetra-hydro-5-methoxy psoralene and dehydrogenerating the 3,4,4',5' tetrahydro-5-methoxy psoralen to obtain 5-methoxy psoralene.

4,429,139

PROCESS FOR THE PREPARATION OF ROSE OXIDE

Charles Fehr, Versoix, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Oct. 19, 1982, Ser. No. 435,314

Claims priority, application Switzerland, Nov. 4, 1981, 7042/81

Int. Cl.³ C07D *309/04*

U.S. Cl. 549—356 4 Claims

1. A process for the preparation of rose oxide which comprises the following reaction steps:

a. an epoxydation of citronellol to give 3,7-dimethyl-6,7-epoxy-1-octanol;

b. a treatment of the obtained mixture with thiophenol to give 3,7-dimethyl-6-phenylthio-1,7-octanediol;

c. an oxidation of the obtained product to give the corresponding sulfoxide;

d. a thermal treatment of 3,7-dimethyl-6-phenylsulfinyl-1,7-octanediol thus obtained at a temperature of between about 300° and 400° C., and

e. a treatment of the reaction mixture thus formed with an acidic cyclizing agent.

4,429,140

PROCESS FOR PREPARING DIBENZYLIDENE SORBITOLS AND DIBENZYLIDENE XYLITOLS

Koichi Murai, Nagaokakyo; Toshiaki Kobayashi, Kyoto, and Kango Fujitani, Uji, all of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan

PCT No. PCT/JP81/00105, § 371 Date Dec. 29, 1981, § 102(e) Date Dec. 29, 1981, PCT Pub. No. WO81/03331, PCT Pub. Date Nov. 26, 1981

PCT Filed May 1, 1981, Ser. No. 336,376

Int. Cl.³ C07D *407/00*

U.S. Cl. 549—370 6 Claims

1. A process for preparing a 1,3:2,4-dibenzylidene sorbitol or 1,3:2,4-dibenzylidene xylitol comprising reacting sorbitol or xylitol with a substituted or unsubstituted benzaldehyde or alkyl acetal derivative thereof in the presence of an acid catalyst, a hydrophobic organic solvent, and a water-soluble organic polar solvent,

said hydrophobic solvent being selected from the group consisting of cyclohexane, a cyclohexane substituted with lower alkyl, a chain saturated hydrocarbon having 6 to 16 carbon atoms, a carbon tetrahalide, an aromatic hydrocarbon, a hydrocarbon halide, an ether, a nitro compound, an ester, a ketone and decalin,

said water-soluble organic polar solvent being selected from the group consisting of an alcohol, a glycol ether, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, sulfolane, dimethylsulfolane, dioxane, cyclohexanone and diglyme,

said hydrophobic organic solvent being used in an amount sufficient to permit the resulting 1,3:2,4-dibenzylidene sorbitol or 1,3:2,4-dibenzylidene xylitol to separate out as crystals and sufficient to maintain the reaction system in the form of a gel to solid phase, and

said reaction being conducted with forced agitation.

4,429,141

PHYSIOLOGICALLY ACTIVE COMPOUNDS AND THEIR ISOLATION

Laszlo L. Darko, Redding, Conn.; Koji Nakanishi, New York, N.Y., and Masachi Nakagawa, Osaka, Japan, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

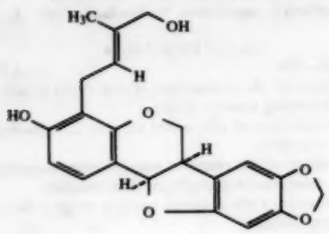
Filed Mar. 15, 1982, Ser. No. 357,805

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—382 7 Claims

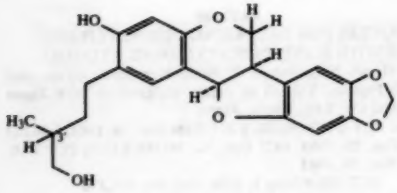
1. A substantially pure crystalline compound having a melting point of 167°–168° C. and the following structure:

(I)



3. A mixture of compounds having the structure

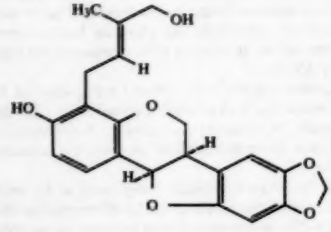
(II)



which comprises a 3:1 mixture of epimers at C-3'.

4. A method of manufacturing substantially pure crystalline compound having a melting point of 167°–168° C. of the structure:

(I)



which method comprises the steps of

(a) preparing a crude aqueous alcoholic extract from the comminuted root of the *cabeca de negra* tree;

(b) concentrating the crude extract to an oily residue;

(c) treating said oily residue with aqueous methanol and thereafter extracting with hexane;

(d) extracting the aqueous layer resulting from step (c) with ether;

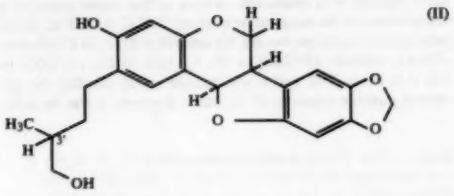
(e) subjecting the ether layer resulting from step (d) to high pressure liquid chromatography employing an eluting solution comprising methanol;

(f) separating a first fraction and a second fraction; and

(g) recovering from said first fraction compound (I).

6. A method of manufacturing a compound of the structure

(II)



which method comprises the steps of

(a) preparing a crude aqueous alcoholic extract from the comminuted root of the *cabeca de negra* tree;

(b) concentrating the crude extract to an oily residue;

(c) treating said oily residue with aqueous methanol and thereafter extracting with hexane;

(d) extracting the aqueous layer resulting from step (c) with ether;

(e) subjecting the ether layer resulting from step (d) to high pressure liquid chromatography employing an eluting solution comprising methanol;

(f) separating a first fraction and a second fraction; and

(g) recovering from said second fraction compound (II).

4,429,142

XANTHENE COMPOUNDS

Richard L. Cournoyer, Waltham, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

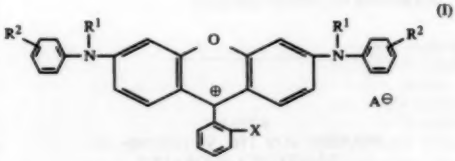
Division of Ser. No. 169,834, Jul. 17, 1980, Pat. No. 4,304,834, which is a continuation-in-part of Ser. No. 106,901, Dec. 26, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 281,981

Int. Cl.³ C07D *311/82*

U.S. Cl. 549—394 **9 Claims**

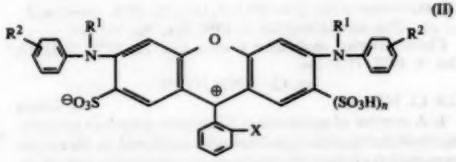
1. A compound of the formulae

(I)

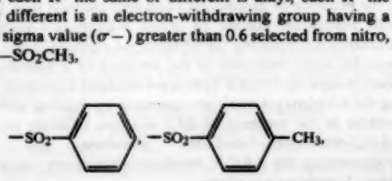


and

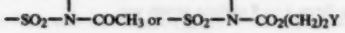
(II)



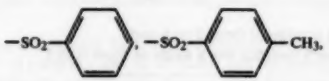
wherein each R^1 the same or different is alkyl; each R^2 the same or different is an electron-withdrawing group having a positive sigma value ($\sigma-$) greater than 0.6 selected from nitro, cyano, $-SO_2CH_3$,



—COOCH$_3$, —SO$_2$N(CH$_2$Ph)$_2$, —SO$_2$N(CH$_3$)$_2$, —CHO, —COOH, —COOC$_2$H$_5$ and —CONH$_2$; X is



wherein R^3 is alkyl; Y is an electron-withdrawing group selected from nitro, cyano, —SO$_2$CH$_3$,



—COOCH$_3$, —SO$_2$N(CH$_2$Ph)$_2$, —SO$_2$N(CH$_3$)$_2$, —CHO, —COOH, —COOC$_2$H$_5$ and —CONH$_2$; n is 0 or 1; and A is an anion.

4,429,143

CYCLIC MONOMERS DERIVED FROM TRIFLUOROPYRUVATE ESTERS

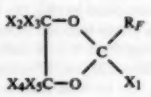
Burton C. Anderson; David C. England, and Paul R. Resnick, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sep. 28, 1981, Ser. No. 306,390

Int. Cl.^{3} C07D *317/00*

U.S. Cl. 549—450 **27 Claims**

1. A dioxolane of the formula:



wherein:

X_1 is selected from the group consisting of Cl, F, COF, COCl, CO_2CCl_3, CO_2R and CO_2M;

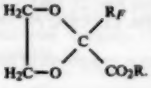
R is selected from the group consisting of H and alkyl of 1 to 4 carbon atoms;

R_F is perfluoroalkyl of 1 to 4 carbon atoms;

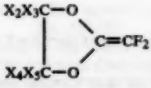
M is selected from the group consisting of alkali metal ion and ammonium;

X_2, X_3, X_4 and X_5, independently, are selected from the group consisting of H, Cl and F; with the proviso that when X_2, X_3, X_4 and X_5 are each H, X_1 is CO_2R or CO_2M.

2. A dioxolane according to claim **1**:



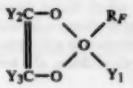
19. A dioxolane of the formula:



wherein

X_2, X_3, X_4 and X_5, independently, are Cl or F, provided that at least two are F.

22. A dioxole of the formula:



wherein Y_1, Y_2 and Y_3, independently, are F or Cl, and R_F is perfluoroalkyl of 1 to 4 carbon atoms.

25. A process for preparing a dioxolane of claim **2** comprising reacting a fluorinated keto ester of the formula

R_FCOCO_2R

with at least one member of the group consisting of 2-chloroethanol, 2-bromoethanol, and ethylene oxide.

4,429,144

PREPARATION OF ROSE OXIDE PREDOMINANTLY CONTAINING THE Z ISOMER

Werner Hoffman, Neubofen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

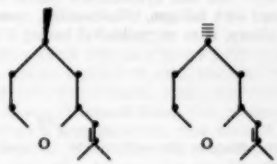
Filed Dec. 9, 1982, Ser. No. 448,345

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150234

Int. Cl.^{3} C07D *309/04*

U.S. Cl. 549—356 **1 Claim**

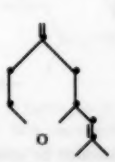
1. A process for the preparation of a mixture of Z- and E-2-[2-methylprop-1-en-1-yl]-4-methyltetrahydropyran isomers of the formulae Z-I and E-I



(Z-I) (E-I)

containing not less than 85% of Z-I and not more than 15% of E-I, wherein 2-[2-methylprop-1-en-1-yl]-4-methylenetetrahydropyran of the formula II

II



is hydrogenated over a platinum dioxide or platinum/charcoal catalyst in the presence of a strongly acidic cation exchanger.

4,429,145

PREPARATION OF TRIMETHYLSILYL CYANIDE

Manfred T. Reetz, Marburg, and Ioannis Chatziosifidis, Buehlertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,961

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139456

Int. Cl.^{3} C07F *7/10*

U.S. Cl. 556—415 **8 Claims**

1. In the preparation of trimethylsilyl cyanide, $(CH_3)_3Si$-CN, by reacting trimethylsilyl chloride and and alkali metal cyanide in the presence of N-methylpyrrolidone, the improvement

which comprises effecting the reaction with an approximately equimolar amount of alkali metal cyanide and trimethylsilyl chloride in the substantial absence of water and in the presence of catalytic, sub-stoichiometric amounts of both an alkali metal iodide and N-methylpyrrolidone, at a temperature of about 15° to 25° C.

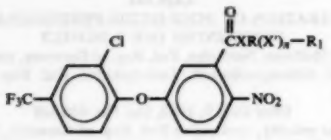
4,429,146

SUBSTITUTED DIPHENYL ETHER HERBICIDES AND PROCESS FOR USE

Kou-Chang Liu, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,558
Int. Cl.³ C07C *79/46*
U.S. Cl. 560—21 **21 Claims**

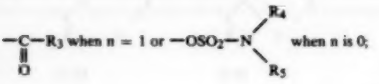
1. A herbicidal compound having the formula



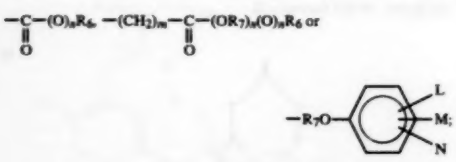
wherein

R is a saturated or unsaturated, straight chain or branched aliphatic hydrocarbon radical of from 1 to 18 carbon atoms wherein one or more of the —CH_2— groups can be replaced with —O—, —S—, —S—S—, —SO—, —SO_2— or —NR_2— and said hydrocarbon radical is optionally substituted with halogen, trihalomethyl, cyano, aryl, hydroxy, alkoxy, nitro or cycloalkyl having 3 to 6 carbon atoms;

R_1 is



R_3 is



R_2 is hydrogen or a saturated or unsaturated straight or branched chain aliphatic radical having from 1 to 8 carbon atoms, optionally substituted with halogen, hydroxy, alkoxy, cyano or nitro;

R_4 and R_5 are independently a saturated or unsaturated, straight or branched chain aliphatic radical having 1 to 8 carbon atoms optionally substituted with halogen, trihalomethyl, alkoxy or cyano; hydrogen or phenyl optionally substituted with halogen, alkyl, alkoxy, trihalomethyl, nitro or cyano;

R_6 is a saturated or unsaturated straight chain or branched aliphatic radical containing from 1 to 8 carbon atoms, optionally substituted with halogen, trihalomethyl, cyano, hydroxy, nitro, acetoxy, alkoxy, thioalkoxy or aryl; an aryl radical optionally substituted with halogen, trihalomethyl, hydroxy, cyano, nitro, alkyl or alkoxy; a cyclic 3–6 membered ring alkylene or 5–6 membered ring alkenylene or benzyl optionally substituted with halogen, trihalomethyl, alkyl, hydroxy, alkoxy or cyano;

R_7 is an alkylene diradical having from 1 to 6 carbon atoms;

X and X′ are each independently —O—, —S— or —NR_2—

L, M and N are each independently hydrogen, hydroxy, halogen, trihalomethyl, nitro, cyano, alkyl or alkoxy having from 1 to 4 carbon atoms and

m has a value of from 1 to 6 and

n in each instance has a value of from 0 to 1.

4,429,147

PROCESS FOR THE PREPARATION OF DIESTERS OF SATURATED CARBOXYLIC ACIDS

Giovanni Agnes; Guglielmo Rucci, and Claudio Santini, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 9, 1982, Ser. No. 396,670
Claims priority, application Italy, Jul. 14, 1981, 22918 A/81
Int. Cl.³ C07C *67/38*
U.S. Cl. 560—81 **11 Claims**

1. A process for the preparation of alkyl diesters of saturated dicarboxylic acids, which comprises reacting an unsaturated olefinic compound having formula (II):

$$R_1CH{=}CHR_2 \qquad (II)$$

in which R_1 and R_2, either equal to or different from each other, are selected from the group consisting of hydrogen atoms, alkyl groups having up to 6 carbon atoms, and an arylalkylaryl-and arylalkyl groups having up to 8 carbon atoms, with a copper (II) compound having the formula; Cu(OR)X in which R represents a group selected from the group consisting of alkyl radical having from 1 to 8 carbon atoms and alkoxyethyl radicals —CH_2—CH_2—OR′ wherein R′ represents an alkyl radical having up to 6 carbon atoms, and wherein X represents chlorine or bromine, and with carbon monoxide in the presence of at least a catalyst selected from the group consisting of palladium salts, zerovalent palladium compounds and metal palladium, at a temperature comprised between about 20° C. and 200° C.

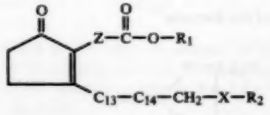
4,429,148

15-DEOXY-16-HYDROXY-16-SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

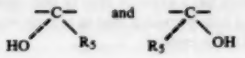
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Garnerville, N.Y., and Sow-Mei Lai Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 79,126, Sep. 26, 1979, Pat. No. 4,328,358.
This application Sep. 25, 1981, Ser. No. 305,901
Int. Cl.³ C07C *177/00*
U.S. Cl. 560—118 **2 Claims**

1. An optically active compound of the formula:



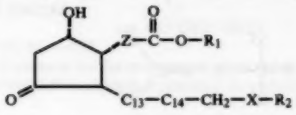
or racemic mixture of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is selected from the group consisting of alkyl having from 3 to 7 carbon atoms; X is a divalent moiety selected from the group consisting of those of the formulae:



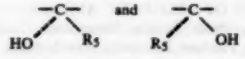
wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; Z is a divalent moiety selected from the group consisting of those of the formulae:

wherein n is an integer from 3 to 5 inclusive; the moiety —C_{1-3}—C_{14}— is trans-vinylene or ethylene; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

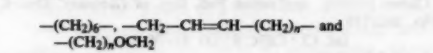
2. An optically active compound of the formula:



or a racemic mixture of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is selected from the group consisting of alkyl having from 3 to 7 carbon atoms; X is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; Z is a divalent moiety selected from the group consisting of those of the formulae:



wherein n is an integer from 3 to 5 inclusive; the moiety —C_{1-3}—C_{14}— is trans-vinylene or ethylene; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,429,149

4-PHENYL-2-INDANYL ESTERS OF 1R,CIS-3-(2-HALO-3,3,3-TRIFLUOROPROPENYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLIC ACID

John F. Engel, Washington Crossing, Pa., assignor to FMC Corporation, Philadelphia, Pa.

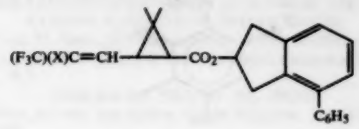
Continuation-in-part of Ser. No. 221,656, Dec. 31, 1980, Pat. No. 4,333,950, which is a continuation-in-part of Ser. No. 42,372, May 24, 1979, Pat. No. 4,263,319, which is a continuation-in-part of Ser. No. 927,198, Jul. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 870,973, Jan. 20, 1978, abandoned. This application Apr. 20, 1982, Ser. No. 370,217

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ C07C *69/743*

U.S. Cl. 560—124 **10 Claims**

1. A 4-phenyl-2-indanyl 1R,cis-3-(2-halo-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate of the formula



wherein X is a halogen atom.

4,429,150

MANUFACTURE OF ETHYLIDENE DIACETATE

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 6, 1981, Ser. No. 280,422

Claims priority, application United Kingdom, Sep. 15, 1980, 8029687

Int. Cl.³ C07C *67/36, 67/37, 69/16*

U.S. Cl. 560—232 **1 Claim**

1. A method for the manufacture of ethylidene diacetate by reacting methyl acetate and/or dimethyl ether with carbon monoxide and hydrogen in the presence of a catalyst comprising a Group VIII metal compound and a halogen-containing compound wherein the reaction is carried out at an elevated pressure of at least 5 bars and a temperature ranging from about 50° C. to about 200° C. in the presence of a sulphur-containing polar solvent which solvent comprises sulpholane.

4,429,151

PRINS REACTION PRODUCTS OF DIISOAMYLENE, DERIVATIVES THEREOF, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

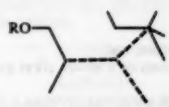
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 267,850, May 28, 1981, Pat. No. 4,359,412. This application Jun. 24, 1982, Ser. No. 391,583

Int. Cl.³ C07C *69/025, 33/025*

U.S. Cl. 560—261 **9 Claims**

1. The compound having the structure:



wherein R represents hydrogen or C_2–C_4 acyl; and wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds.

4,429,152

3-SUBSTITUTED 2,4,6-TRIHALOGENATED BENZAMIDES AS SWEETENING AGENTS

Heinz Gries, and Wolfgang Mütze, both of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

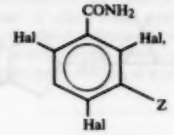
Filed Dec. 22, 1981, Ser. No. 333,364

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048918; Nov. 12, 1981, 3145395

Int. Cl.³ C07C *101/30*

U.S. Cl. 562—442 **18 Claims**

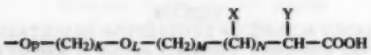
1. A 3-substituted 2,4,6-trihalogenated benzamide having the formula I


(I)

wherein

(A) Hal is a chlorine or bromine atom; and

Z is a carboxyl group or the group



wherein P and L are each independently 0 or 1, with the proviso that L is 0 when either P or K is 0;

K is 0, 2, 3 or 4;

M is 0, 1, 2 or 3;

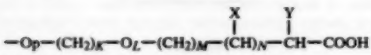
N is 0 or 1;

X is a hydrogen atom;

Y is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms, or when either M or N is other than 0, a hydroxy group, a C_{1-6} alkoxy group or a C_{1-4} acyloxy group, or when N is 1 and M is other than 0, X and Y together form an additional carbon-carbon bond;

or wherein

(B) Hal is an iodine atom; and Z is a carboxyl group or the group



wherein (1) P and L are each 0;

K is 0, 2, 3 or 4;

M is 0, 1, 2 or 3;

N is 0 or 1;

X is a hydrogen atom;

Y is a hydrogen atom, a lower alkyl group of 1–4 carbon atoms, a hydroxy group, a C_{1-6} alkoxy group or a C_{1-4} acyloxy group, or when N is 1, X and Y together form an additional carbon bond;

or (2) P and L are each 1;

K is 2, 3 or 4;

M is 0, 1, 2 or 3;

N is 0 or 1;

X is a hydrogen atom; and

Y is a hydrogen atom or a lower alkyl group of 1–4 carbon atoms;

or a salt thereof with an inorganic base.

4,429,153

HALOGENATED ESTERS

Nazim Punja, Crowthorne, England, assignor to Imperial Chemical Industries PLC, London, England

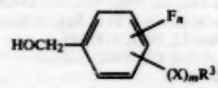
Division of Ser. No. 211,943, Dec. 1, 1980. This application Jan. 15, 1982, Ser. No. 339,733

Claims priority, application United Kingdom, Dec. 21, 1979, 7944151; Nov. 20, 1980, 8037257

Int. Cl.³ C07C *63/04, 33/46*

U.S. Cl. 562—493 **5 Claims**

1. A compound of formula:



wherein X represents oxygen, sulphur or sulphonyl; and R^3 represents alkyl of up to six carbon atoms, alkenyl of up to six carbon atoms, or benzyl; m has a value of zero or one, and n is an integer of from one to four provided that m is zero when n is four, X is oxygen and R^3 is methyl.

4,429,154

FLUORINATED AZOMETHINE COMPOUNDS

Bernd Baasner, Leverkusen; Erich Klauke, Odenthal; Hermann Hagemann, Cologne, and Engelbert Kühle, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

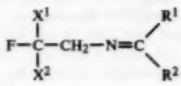
Continuation of Ser. No. 254,718, Apr. 16, 1981. This application May 24, 1982, Ser. No. 381,132

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3018020

Int. Cl.³ C07C *119/08*

U.S. Cl. 564—278 **7 Claims**

1. Fluorinated azomethine compound of the formula


(I)

wherein

X^1 is hydrogen, fluorine or chlorine;

X^2 is hydrogen, fluorine or chlorine;

R^1 is hydrogen methyl, ethyl, n-propyl or n-butyl and

R^2 is hydrogen, methyl or ethyl.

4,429,155

PREPARATION OF AROMATIC AMINES

Norbert Götz, Worms; Peter Jacobs, Gruenstadt; Leopold Hupfer, Friedelsheim; Herbert Toussaint, Frankenthal, and Wolfgang Reiss, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

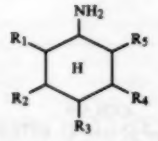
Filed Dec. 1, 1981, Ser. No. 326,419

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045719

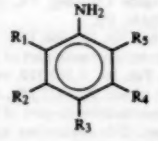
Int. Cl.³ C07C *85/00, 85/06, 85/24*

U.S. Cl. 564—402 **6 Claims**

1. A process for the preparation of cycloaliphatic or aromatic amines (I, Ia)


I

or


Ia

wherein each R_1 to R_5 may be hydrogen or a substituent selected from the group consisting of alkyl, cycloalkyl, aryl, arylalkyl and alkylaryl, said substituent either containing or being free of oxygen and/or nitrogen atoms, wherein each R_1 to R_5 may be linked to its neighboring R by a molecular bridge which comprises: reacting either a corresponding aromatic hydroxy compound (phenol) with ammonia and hydrogen or a

corresponding cycloaliphatic amine which is obtained as an intermediate or obtained independently, with or without ammonia and/or hydrogen at an elevated temperature in the presence of a supported palladium catalyst which contains a basic substance and/or an element from group 1b, 2b or 7b of the periodic table, iron, cobalt or nickel.

4,429,156

PROCESS FOR THE PREPARATION OF M-HALOGEN-SUBSTITUTED ANILINES

Karlfried Wedemeyer, Cologne; Ferdinand Hagedorn, Leverkusen, and Werner Evertz, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

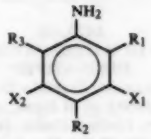
Filed Oct. 22, 1981, Ser. No. 313,905

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042242

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—412 **25 Claims**

1. A process for the preparation of an m-halogen-substituted aniline which comprises contacting an aniline of the formula



wherein

X_1 and X_2 are identical or different and represent chlorine, bromine, iodine, hydrogen or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical with the proviso that at least one of X_1 and X_2 is chlorine, bromine or iodine;

R_1, R_2 and R_3 are identical or different and represent chlorine, bromine, iodine, hydrogen or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aryloxy radical, at least one of the radicals R_1, R_2 or R_3 representing chlorine, bromine or iodine with hydrogen in an acid medium in the presence of a nobel metal,

the process being carried out in the presence of hydrogen iodide or a compound which under the process conditions yields hydrogen iodide and in the presence of an optionally substituted phenol.

4,429,157

PROCESS FOR THE PREPARATION OF PRIMARY MONO- AND DIAMINES FROM OXO COMPOUNDS

Josef Disteldorf, Am Sengenhoff 2a; Werner Hübel, Birnenbruchstrasse 34, both of 4690 Herne 1, and Lothar Broschinski, Lüenbrink 18, 4760 Werl, all of Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,386

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3021955

Int. Cl.³ C07C *85/08*

U.S. Cl. 564—446 **29 Claims**

1. A process for preparing primary amines comprising:

(1) reacting an oxo compound with ammonia in the presence of an imine-forming catalyst at a temperature of 10° to 120° C. and a pressure of 1 to 300 bar, whereby a Schiff base is formed; and

(2) reducing said Schiff base by reaction with ammonia and hydrogen in the presence of a hydrogenation catalyst,

wherein said imine-forming catalyst is an ion exchanger loaded with ammonium ions.

4,429,158

POLYAMINE COMPOUNDS AND THEIR USE AS CURING AGENTS FOR EPOXY RESINS

Raymond H. Good, Barrington, Ill., and Paul McBride, Aughton, England, assignors to Eastman Kodak Company, Rochester, N.Y.

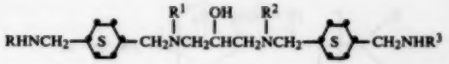
Filed Sep. 14, 1981, Ser. No. 301,919

Claims priority, application United Kingdom, Jun. 16, 1981, 8118448

Int. Cl.³ C07C *87/36, 87/38*

U.S. Cl. 564—455 **7 Claims**

1. A compound having the structure



wherein R, R^1, R^2 and R^3 are each independently selected from hydrogen and straight or branched chain alkyl groups of 1 to 10 carbons, and such groups substituted with 1–3 of the same or different groups selected from alkoxy of 1–10 carbons, phenyl, cyclohexyl and hydroxyl.

4,429,159

CATALYST SEPARATION IN PRODUCTION OF AMINES

Charles E. Cutchens, Pensacola, Fla., and Lynn H. Lanier, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 18, 1983, Ser. No. 476,741

Int. Cl.³ C07C *87/14, 87/16*

U.S. Cl. 564—492 **6 Claims**

1. In a process for the production of an amine from a nitrile where the nitrile is hydrogenated, using hydrogen produced from methane and containing carbon dioxide, under pressure in the presence of a Raney Nickel catalyst continuously in a reactor thereby to produce the amine which is discharged into the stream from which is recovered by separation in a vessel a crude amine stream from the upper layer and a catalyst slurry stream from the lower layer, the improvement comprising maintaining an essentially constant carbonate concentration at such a level during separation as to minimize the amount of fines in the upper layer, improve settling characteristics of the catalyst in the vessel and reduce consequent catalyst carryover into the crude amine stream.

4,429,160

POLYOXAALKYL AMINOALCOHOLS

Louis Linguenheld, Ruelisheim, and Gerard Soula, Meyzieu, both of France, assignors to Rhone-Poulenc Industries, Paris, France

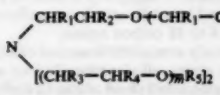
Filed Aug. 25, 1981, Ser. No. 296,214

Claims priority, application France, Aug. 27, 1980, 80 18561

Int. Cl.³ C07C *93/04*

U.S. Cl. 564—505 **23 Claims**

1. A polyoxaalkyl aminoalcohol having the structural formula:



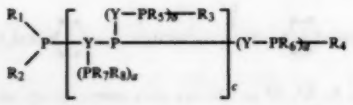
wherein R_1, R_2, R_3 and R_4, which may be identical or different, are each a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms; R_5 is an alkyl radical of 1 or 2 carbon atoms; n is an integer ranging from 1 to 9; and m is an integer ranging from 1 to 10.

4,429,161
PROCESS FOR PREPARING ORGANIC TERTIARY POLYPHOSPHINE MONOOXIDES

Anthony G. Abatjoglou, Charleston, and Louis A. Kapicak, Cross Lanes, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 17, 1981, Ser. No. 293,145
Int. Cl.³ C07F 9/53
U.S. Cl. 568—14 **11 Claims**

1. A process for producing an organic tertiary polyphosphine monooxide which comprises reacting an organic tertiary polyphosphine compound having the general formula



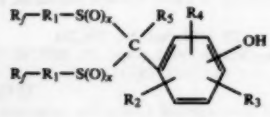
wherein each R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 represent an identical or different, substituted or unsubstituted monovalent hydrocarbon radical containing from 1 to 30 carbon atoms, wherein each Y represents an identical or different organic bridging group containing from 1 to 30 carbon atoms selected from the group consisting of hydrocarbon radicals, oxygen containing hydrocarbon radicals, nitrogen containing hydrocarbon radicals and sulfur containing hydrocarbon radicals, wherein a, b and d each represent a value of zero or 1, and wherein c represents an integer of from 1 to 3; with an organic monofunctional alkylating agent containing from 1 to 30 carbon atoms selected from the group consisting of monovalent hydrocarbon halides and monovalent hydrocarbon sulfates, in the presence of an inert organic solvent for said organic tertiary polyphosphine compound to form an insoluble monophosphonium salt of said organic tertiary polyphosphine compound; hydrolyzing said salt compound with an aqueous alkaline solution to form an organic tertiary polyphosphine monooxide product wherein the oxygenated phosphorous atom of said monooxide product corresponds to the alkylated phosphorus atom of said monophosphonium salt, and recovering the monooxide product so produced.

4,429,162
PERFLUOROALKYL PHENOLS AND NAPHTHOLS

Thomas W. Cooke, Mahopac, and Robert A. Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,681
Int. Cl.³ C07C 149/36, 149/42
U.S. Cl. 568—50 **9 Claims**

1. A compound of the formula



(I)

wherein

each R_f is independently straight or branched chain perfluoroalkyl of 2 to 18 carbon atoms or perfluoroalkoxyperfluoroalkyl of 4 to 18 carbon atoms;

each R_1 is independently straight or branched chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxalkylene of 2 to 12 carbon atoms, or alkyleneiminoalkylene of 2 to 12 carbon atoms where the imino nitrogen atom contain as a third substituent hydrogen or alkyl of 1 to 6 carbon atoms;

each R_2, R_3 and R_4 is independently hydrogen, chloro, bromo, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms, and R_2 and R_3 additionally may, together with the carbon atoms to which they are attached, form a fused benzo ring;

R_5 is hydrogen or alkyl of 1 to 6 carbon atoms which is unsubstituted or substituted by hydroxy, alkoxy of 1 to 7 carbon atoms or phenyl;

x is 0, 1 or 2; and

the alkali metal, alkaline earth metal, ammonium or amine phenate salt wherein the amine cation thereof is of the formula

(Ia)

where R_6, R_7 and R_8 are independently hydrogen, alkyl of 1 to 5 carbon atoms, hydroxyalkyl of 2 to 5 carbon atoms, ethyleneoxyethanol or polyethyleneoxyethanol having 2 to 20 ethyleneoxy units; and

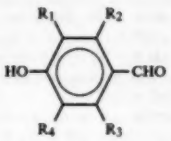
R_9 is hydrogen, alkyl of 1 to 23 carbon atoms, hydroxyalkyl of 2 to 5 carbon atoms, phenyl, benzyl, cyclohexyl, ethyleneoxyethanol or polyethylenoxyethanol having 2 to 20 ethyleneoxy units.

4,429,163
PREPARATION OF P-HYDROXYBENZALDEHYDE DERIVATIVES

Kanji Nishizawa, Takatsuki; Kazuhiko Hamada, and Tadatoshi Aratani, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 99,714, Dec. 3, 1979, abandoned. This application Aug. 4, 1981, Ser. No. 289,991
Claims priority, application Japan, Dec. 13, 1978, 53-155974
Int. Cl.³ C07C 45/36
U.S. Cl. 568—432 **9 Claims**

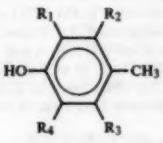
1. A process for the production of a 4-hydroxybenzaldehyde derivative of the formula:



(I)

wherein each of R_1, R_2, R_3 and R_4 is selected from the group consisting of hydrogen atoms, halogen atoms, C_1–C_4 alkyl and C_1–C_4 alkoxy,

said process comprising the reaction of a p-cresol derivative of the formula:



(II)

wherein each of R_1, R_2, R_3 and R_4 is as defined above, with a molecular oxygen or a molecular oxygen-containing gas in an alcohol solvent, in the presence of a base selected from the group consisting of metal hydroxides, metal alkoxides and metal amides, and a catalyst selected from the group consisting of cobalt halides, organic acid salts of cobalt, inorganic acid salts of cobalt, cobalt oxides, cobalt hydroxides, cobalt chelates and metallic cobalt, wherein the molar ratio of the base to the p-cresol derivative is in the range of 1.0–10.0 and wherein the molar ratio of the cobalt com-

pound to the p-cresol derivative is in the range of 0.0005–0.05.

4,429,164

CYCLOHEXADIENE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Shigeru Torii; Hideo Tanaka, both of Okayama; Mitsuo Akada, Tokushima; Tsunehiko Masatomi, Tokushima, and Yasuo Shimizu, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushini Kaisha, Japan

PCT No. PCT/JP81/00300, § 371 Date Jun. 22, 1982, § 102(e) Date Jun. 22, 1982, PCT Pub. No. WO82/01547, PCT Pub. Date May 13, 1982

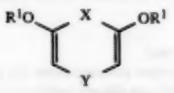
PCT Filed Oct. 28, 1981, Ser. No. 394,912

Claims priority, application Japan, Feb. 25, 1981, 56-27474; Feb. 25, 1981, 57-27475

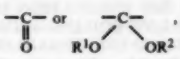
Int. Cl.³ C07C *49/603*

U.S. Cl. 568—377 **1 Claim**

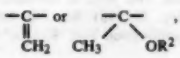
1. Cyclohexadiene derivatives represented by the formula (I)



(wherein —X— represents



—Y— represents



and R^1 and R^2 represent a lower alkyl group.)

4,429,165

HYDROFORMYLATION PROCESS

Richard W. Wegman, Cross Lanes, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 24, 1982, Ser. No. 391,679

Int. Cl.³ C07C *45/49*

U.S. Cl. 568—487 **29 Claims**

1. In a catalytic reaction process for selectively producing acetaldehyde and dimethylacetal by the reaction of methanol, hydrogen and carbon monoxide at a pressure of from 750 psig to 10,000 psig, a temperature of from 100° C. to 250° C. and a $CO:H_2$ mole ratio of 0.1:1 to 10:1 and wherein the catalyst consists essentially of cobalt and halide atoms, the improvement consisting of carrying out the reaction in contact with a promoting mixture consisting essentially of (i) a trivalent nitrogen compound of the general formula NR_3 or $R''CONR_2''$ and (ii) a trivalent phosphorus compound of the general formula PR_3 or $R_2PC_nH_{2n}PR_2$, wherein R is an alkyl group having 1 to 20 carbon atoms, or an aryl group having 6 to 10 ring carbon atoms, or a cycloalkyl group having 5 to 8 ring carbon atoms; R'' is hydrogen, or an alkyl group having 1 to 20 carbon atoms, or an aryl group having 6 to 10 ring carbon atoms, or a cycloalkyl group having 5 to 8 ring carbon atoms and n is an integer having a value of from 2 to 8; wherein Total ER_3 is the sum of trivalent nitrogen compound and trivalent phosphorus compound and Total ER_3:halide mmole ratio is from 0.1 to 2.8:1 and wherein the amount of trivalent nitrogen compound in Total ER_3 is from 5 mole % to 50 mole %.

4,429,166

METHOD OF PREPARING BICYCLO(3.1.1)HEPT-2-ONE

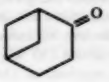
Kyriacos C. Nicolaou, Havertown, Pa.; Ronald L. Magolda, Vineland, N.J., and David A. Claremon, Philadelphia, Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 194,399, Oct. 6, 1980, Pat. No. 4,317,935, which is a division of Ser. No. 87,678, Oct. 24, 1979, Pat. No. 4,260,806. This application Aug. 4, 1981, Ser. No. 289,965

Int. Cl.³ C07C *45/45*

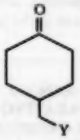
U.S. Cl. 568—352 **2 Claims**

1. A method of preparing bicyclo hept-2-one of formula (1)



which comprises:

cyclizing a ketone of formula (2)



wherein Y is a leaving group capable of being internally displaced by a base-generated α-carbanion on said ketone of formula (2), with 2.0–2.5 equivalents of dimsyl potassium in dilute solution of dimethyl sulfoxide at 15°–25° C.

2. The method of claim 1 wherein Y is a tosyl group.

4,429,167

3-ALKOXY-4-SUBSTITUTED-PHENOXY-2,3-UNSATURATED ACIDS, ESTERS AND DERIVATIVES

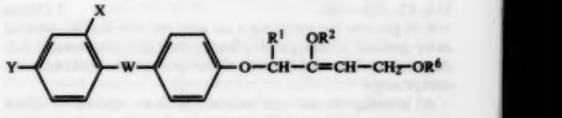
Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 299,413, Sep. 4, 1981, which is a continuation-in-part of Ser. No. 270,938, Jun. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 196,795, Oct. 14, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,736

Int. Cl.³ C07C *43/295, 69/734, 69/736*

U.S. Cl. 568—636 **6 Claims**

1. A compound of the formula



wherein, W is oxygen, R^1 is hydrogen or lower alkyl, R^2 is lower alkyl, R^6 is hydrogen or acyl, and each of X and Y is independently selected from hydrogen, bromo, chloro, fluoro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, nitro, cyano, trifluoromethyl, chlorodifluoromethyl, fluoromethyl, chloromethyl and difluoromethoxy.

4,429,168

PROCESS FOR SEPARATING CHLORINATED PHENOLS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 372,060
Int. Cl.[3] C07C 37/68
U.S. Cl. 568—755 24 Claims

1. A process for resolving a mixture of two or more phephenolics at least one of which is a chlorinated phenolic, comprising the step of:

treating a mixture of two or more closely-boiling phenolics at least one of which is a chlorinated phenolic with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride, lithium bromide, magnesium chloride and magnesium bromide, at a temperature of from about 0° C. to about 150° C., so as to form preferentially a complex comprised of the selected metal halide salt and one of the phenolics,

whereby the preferentially-formed metal halide salt-phenolic complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of one phenolic over other phenolics present, as compared to the relative amounts of phenolics present in the original mixture of phenolics.

4,429,169

PROCESS FOR SEPARATING ISOPROPYLATED M-CRESOLS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 372,055
Int. Cl.[3] C07C 37/68
U.S. Cl. 568—756 6 Claims

1. A process for resolving a mixture of two or more isopropylated m-cresols, one of which is m-thymol, comprising the step of:

treating a mixture of two or more closely-boiling isopropylated m-cresols, one of which is m-thymol, said mixture having a temperature in a range from about 0° C. to about 150° C., with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride, lithium bromide, magnesium chloride and magnesium bromide, so as to form preferentially a complex comprised of the selected metal halide salt and m-thymol,

whereby the preferentially-formed metal halide salt m-thymol complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of m-thymol over other isopropylated m-cresols present, as compared to the relative amount of m-thymol present in the original mixture of isopropylated m-cresols.

4,429,170

PROCESS FOR REMOVING TAR BASES FROM LURGI TAR ACID STREAM

Robert L. Lovell, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 14, 1982, Ser. No. 398,068
Int. Cl.[3] C07C 37/74, 37/68
U.S. Cl. 568—761 3 Claims

1. A process for purifying a tar acid mixture that is obtained as by-product of coal gasification by the Lurgi process and that contains tar base and neutral oil components as contaminants, comprising:

(a) treating the tar acid mixture with an amount of dilute aqueous sulfuric acid solution having a range from about 10 to about 25 concentration by weight percent of H_2SO_4 in an amount of at least about fifty percent stoichiometric excess of the amount of tar base component initially present in the tar acid mixture, at a temperature in a range from about 80° C. to about 120° C., for sufficient time to form non-volatile tar base salts from the tar base component and to form hydrolysis products of the neutral oil component; and then

(b) separating the non-volatile tar base salts and the hydrolysis products from the tar acid mixture by distillation.

4,429,171

METHOD FOR MANUFACTURE OF ORTHOMETHYLATED PHENOL COMPOUNDS

Tokio Sakurai, Yokohama; Kyosuke Komiya, Kawasaki; Yoshihiko Mori, Kawasaki; Yoshiharu Kitahama, Kawasaki, and Isamu Iwami, Zushi, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,003
Claims priority, application Japan, Nov. 28, 1980, 55-166725; Dec. 1, 1980, 55-167964; Jan. 23, 1981, 56-8112
Int. Cl.[3] C07C 37/16
U.S. Cl. 568—804 20 Claims

1. A method for the manufacture of orthomethylated phenol compounds which comprises reacting phenol compounds having at least one hydrogen atom at the ortho position with methanol at a temperature of 250° C. to 500° C. and a space velocity of 0.05 to 10 in LHSV in the presence of a catalyst comprising:

A. iron oxide,

B. indium oxide, and

C. at least one member selected from the group consisting of chromium oxide and silicon oxide.

4,429,172

PROCESS FOR THE PRODUCTION OF MODIFIED PITCHES AND LOW BOILING AROMATICS AND OLEFINS AND USE OF SAID PITCHES

Robert Zellerhoff, Dinslaken; Maximilian Zander, and Franz Kajetanczyk, both of Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 305,001
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037829
Int. Cl.[3] C07C 1/00, 4/00; C10B 57/04
U.S. Cl. 585—241 4 Claims

1. A process for the production of modified pitches and low boiling aromatics and olefins by thermal treatment of polyolefin plastic wastes in the presence of high boiling aromatics, consisting essentially of thermally treating 10–80 parts by weight of comminuted wastes of polyolefins at temperature above the decomposition point of said polyolefins and at a pressure between 1 and 30 bar with 20–90 parts by weight of an aromatic hydrocarbon mixtures boiling above 300° C. selected from the group consisting of filtered anthracene oil and bituminous coal tar pitch, under an atmosphere of an inert gas, whereby olefins, benzene homologues as well as a reaction pitch are obtained after distillative separation.

4,429,173

PRODUCTION OF HIGH-OCTANE, UNLEADED MOTOR FUEL BY ALKYLATION OF ISOBUTANE WITH ISOAMYLENES OBTAINED BY DEHYDROGENATION OF ISOPENTANE

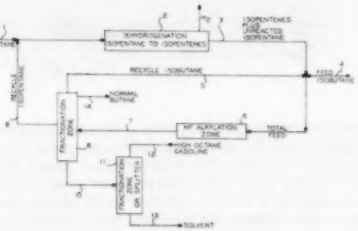
Thomas Hutson, Jr., and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1982, Ser. No. 356,592
Int. Cl.[3] C07C 3/54
U.S. Cl. 585—331 12 Claims

1. A process for production of high-octane alkylate comprising:

(a) introducing an isoparaffin selected from the group consisting of isobutane, isopentane, and mixtures thereof, with olefins consisting essentially of amylenes and an HF catalyst into an alkylation reaction zone;

(b) reacting the materials so introduced into said alkylation reaction zone to form an effluent comprising an alkylate;
(c) separating said effluent into an HF catalyst phase and a hydrocarbon phase;
(d) passing said hydrocarbon phase into a first fractionation zone;
(e) withdrawing said alkylate from said first fractionation zone as a liquid;
(f) withdrawing a first stream comprising isopentane and a second stream comprising isobutane when present from separate leads or trays of said first fractionation zone;



(g) recycling at least a portion of said first stream to a dehydrogenation zone in which said portion of said first stream and an isopentane containing feedstream are at least partially dehydrogenated to form the amylenes to be alkylated in said alkylation reaction zone;
(h) recycling said second stream comprising isobutane when present to a feed conduit to form at least a portion of the isobutane reacted in said alkylation reaction zone; and
(i) recovering said alkylate as the product of the process.

4,429,174

PROCESS FOR DEHYDROCOUPLING TOLUENE USING A MODIFIED FAUJASITE ZEOLITE CATALYST COMPOSITION

Harry H. Teng, Waldwick, and I-Der Huang, Upper Saddle River, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1982, Ser. No. 405,803
Int. Cl.³ C07C *3/62, 3/00*
U.S. Cl. 585—426 **6 Claims**

1. A process for dehydrocoupling a hydrocarbon selected from the group consisting of toluene, toluene derivative, and mixtures thereof which comprises contacting said hydrocarbon with at least one oxygen containing gas, in the vapor phase at a temperature of from about 300° to about 750° C., in the presence of a catalyst composition comprising a crystalline aluminosilicate zeolite of the faujasite structure having an SiO_2:Al_2O_3 mole ratio of from about 2 to about 8, having cesium cations, and at least one promoter selected from the group consisting of B, P, and mixtures thereof present therein.

4,429,175

PROCESS FOR THE PRODUCTION OF ETHYLBENZENE

John L. Cihonski, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Oct. 27, 1982, Ser. No. 437,029
Int. Cl.³ C07C *5/41*
U.S. Cl. 585—433 **7 Claims**

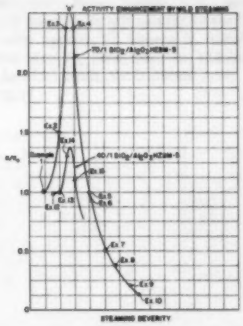
1. A process for the conversion of vinylcyclohexene to ethylbenzene and hydrogen which comprises contacting the vinylcyclohexene with between about 1–15 mole percent of molecular oxygen per mole of vinylcyclohexene, at a temperature in the range between about 190°–260° C. in the presence of a catalyst comprising palladium supported on a non-acidic zeolite carrier substrate; wherein the said catalyst has been pretreated by calcination in a molecular oxygen-containing atmosphere and then by calcination in a hydrogen or C_1–C_{10} nonaromatic hydrocarbon-containing atmosphere prior to vinylcyclohexene conversion, and wherein the said catalyst subsequently is reactivated by application of the said calcination procedure to provide a regenerated catalyst which exhibits substantially the same reactivity and selectivity as the original catalyst in the process.

4,429,176

ACTIVE ZEOLITE CATALYSTS OF IMPROVED STABILITY

Arthur W. Chester, and Yung F. Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,440
Int. Cl.³ C07C *1/00, 1/20, 1/22, 5/30*
U.S. Cl. 585—481 **15 Claims**



1. In an acid-catalyzed reaction using a catalyst comprising a zeolite having a silica/alumina ratio greater than 12 and a constraint index of 1 to 12, the improvement which comprises steaming said zeolite in its fresh state under controlled conditions of temperature, time and steam partial pressure so as to initially increase the α-activity of said catalyst and produce a steamed catalyst having a peak α-activity, and subsequently reduce the α-activity from said peak α-activity to an α-activity substantially the same as the α-activity of said fresh catalyst and no more than 25% below the initial α-activity of said fresh catalyst, said steamed catalyst having enhanced stability over said fresh catalyst.

4,429,177

METHOD OF OLIGOMERIZING 1-OLEFINS AND REGENERATING A HETEROGENEOUS CATALYST

Neal E. Morganson, McCandless Township, Allegheny County, and Paul G. Bercik, Penn Township, Westmoreland County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 333,305, Dec. 22, 1981, Pat. No. 4,365,105.
This application Aug. 4, 1982, Ser. No. 405,231
Int. Cl.³ C07C *2/02;* B01J *27/32*
U.S. Cl. 585—525 **12 Claims**

1. The process for oligomerizing a 1-olefin having from three to about 18 carbon atoms and mixtures thereof using a deactivated catalyst comprising boron trifluoride adsorbed on a solid adsorbent, said catalyst having been deactivated by a prior oligomerization procedure carried out in the absence of elemental oxygen, which process comprises contacting said 1-olefin in a reactor with said deactivated catalyst in the presence of free boron trifluoride and between about 25 ppm and about one weight percent elemental oxygen based on the 1-olefin at a temperature between about −50° and about 150° C., whereby said catalyst is regenerated and said 1-olefin is oligomerized.

2. The process for oligomerizing a 1-olefin having from three to about 18 carbon atoms and mixtures thereof in accordance with claim 1 in which a stream of the 1-olefin is introduced into the reactor and is contacted with the catalyst, and a product stream is removed from the reactor.

3. The process for oligomerizing a 1-olefin having from three to about 18 carbon atoms and mixtures thereof in accordance with claim 2 in which the solid adsorbent has a particle size between about 3 and about 400 mesh (about 0.075 and about 6.7 mm).

4,429,178
SOLAR TRACKING APPARATUS UTILIZING PHOTOVOLTAIC FLAT PANELS AND METHOD

Daniel L. Prideaux, San Jose, and Robert M. Spencer, Cupertino, both of Calif., assignors to Acurex Solar Corporation, Mountain View, Calif.

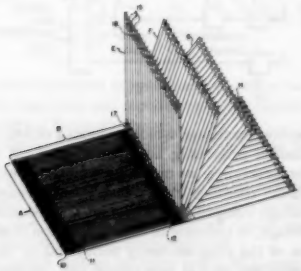
Filed Jul. 13, 1981, Ser. No. 282,916
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—246 **5 Claims**

1. A system for converting solar energy directly to electrical energy, said system comprising: a plurality of photovoltaic or like type flat panels, each of which includes a solar collecting front side and means for generating electricity directly from the sun's rays as the latter impinges on said front side; an arrangement supporting said panels for movement about a single axis only with the sun between sunrise and sunset, said supporting arrangement including first means supporting all of said panels for simultaneous rotation about said single axis such that the solar collecting front sides of said panels are maintained in end-to-end relationship with one another in direct contact with the sun's rays and within a common plane parallel to said axis of rotation and face in the same direction during rotation of the panels and second means cooperating with said first means for simultaneously rotating said panels about said axis in tracking relationship with the sun, said second means including means responsive to the position of the sun between sunrise and sunset for continuously maintaining said panel front sides at an acute angle with respect to the sun's rays and said first means including supporting mechanisms disposed between adjacent ends of at least some of said panels for supporting said panels for said rotation about said axis, the adjacent ends of said panels being spaced from one another only an amount sufficient to accommodate an associated one of said supporting mechanisms whereby to minimize the linear distance between panels; and electrical wire means connected with said panels for carrying the electrical energy generated thereby to a central collecting station.

4,429,179
WOVEN WIRE FANOUT

William R. Chynoweth, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 14, 1982, Ser. No. 378,034
Int. Cl.³ H01B *7/08*
U.S. Cl. 174—117 M **10 Claims**

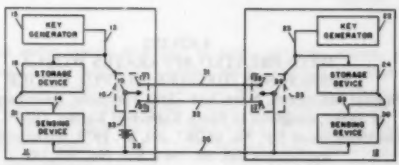


1. A woven assembly comprising:
a plurality of spaced parallel electrical wires having a length and, as measured transverse to the length, having a first density in number of wires per unit distance;
thread means interwoven with said wires to form a first mat of spaced parallel wires having the first density, said thread means interwoven with a first group of said wires to form a second mat of spaced parallel wires of a density less than the first density, said thread means interwoven with a second group of said wires to form a third mat of spaced parallel wires of a density less than the first density, the third mat positioned atop the second mat subsequent to the thread means being interwoven with the first and second groups of said wires but being separable from the second mat for use of the electrical wires.

4,429,180
APPARATUS FOR SIMULTANEOUS GENERATION OF KEY AT TWO LOCATIONS

Willard C. Unkenholz, Silver Spring, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Ft. George G. Meade, Md.

Filed May 19, 1980, Ser. No. 153,984
Int. Cl.³ H04L *9/00*; H04K *1/00*
U.S. Cl. 178—22.17 **8 Claims**

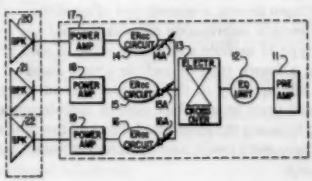


1. An apparatus, comprising:
a pair of terminals located remote from each other, each terminal having a key generator which produces an independent but synchronized binary output;
a circuit connecting said terminals;
switching means at each terminal controlled by that terminal's key generator for opening said circuit only when the output of both key generators are identical, and closing said circuit only when the output of both key generators are not identical; and
means at each terminal for sensing whether said circuit is opened or closed.

4,429,181
AUDIO SYSTEM

Tommyca Freadman, Bney-Brak, Israel, assignor to David Dohan, Israel, a part interest

Filed Sep. 28, 1981, Ser. No. 306,531
Int. Cl.³ H03H *11/34*
U.S. Cl. 381—99 **9 Claims**



1. An audio system having a preamplifier, equalization unit, electronic cross-over, a set of speakers and a set of power amplifiers for driving the set of speakers, and wherein said preamplifier, said equalization unit and set cross-over are con-

nected for passage of an audio signal to said set of power amplifiers, said system further comprising a set of electronic resonance control correction (ERCC) circuits connecting between said cross-over and respective ones of said power amplifiers for modifying said audio signal prior to amplification by said power amplifiers, and wherein

said electronic cross-over delivers an input audio signal of a desired frequency range to each of said ERCC circuits; and wherein each of said ERCC circuits comprises

a plurality of resonators responsive to signals at frequencies at different portions of the input audio signal spectrum:

a nonlinear amplifier for amplifying said input audio signal to generate a control signal; and

decay means operatively connected between said nonlinear amplifier and said plurality of resonators for coupling said control signal to each of said resonators, said decay means decaying said control signal at differing rates for each of said resonators.

4,429,182

DATA-RELATED APPARATUS WITH A SPEECH-SYNTHESIZER OUTPUT DEVICE

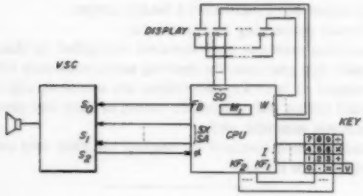
Sigeaki Masuzawa, Nara, and Akira Tanimoto, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 61,247, Jul. 27, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 288,333

Claims priority, application Japan, Jul. 28, 1978, 53-93037

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—51 **5 Claims**



1. A data related apparatus including a key input device for introducing data and function information into said data related apparatus, a processor for processing said data in accordance with said function information to produce a processed result, and a speech synthesizer output device for developing a first type of audible sound indicative of said data entered via said key input device, a second type of audible sound indicative of said function information entered via said key input device, a third type of audible sound indicative of said processed result, and a fourth type of audible sound disposed in time sequence subsequently to the first and second types of audible sounds and prior to said third type of audible sound for distinguishing between the introduced data and function information and the processed result, said speech synthesizer output device comprising:

means for developing a fifth type of audible sound interposed in time sequence between said fourth type of audible sound and said third type of audible sound for further distinguishing between the introduced data and function information and the processed result by audibly indicating that the development of said third type of audible sound indicative of said processed result is forthcoming.

4,429,183

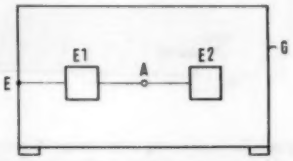
CIRCUIT ARRANGEMENT FOR DETECTING AND INTERPRETING INTERFERENCES WITH AUTOMATIC MACHINES AND PARTICULARLY COIN TELEPHONES

Ferenc Nemecsek, Sindelfingen, and Elmar Wilke, Vaihingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,349

Int. Cl.³ H04M *17/02*

U.S. Cl. 179—6.3 R **6 Claims**



1. A circuit arrangement for use with automatically operating equipment including a facility having an input and an output and operative for detecting and interpreting internal faults of the equipment, and other electronic circuitry connected to the output of the facility and operative for controlling the operation of the equipment under the control of the facility, wherein the operation of the equipment could be influenced by electromagnetic radiation resulting from discharges of static interference voltages originating externally of the equipment, comprising:

means for receiving the electromagnetic radiation and for converting the same into an electric signal; and

means for generating a control signal in response to said electric signal and for supplying the same to the input of the facility for use by the latter for blocking the operation of the equipment.

4,429,184

MITIGATION OF FAULTS IN A TELEPHONE EXCHANGE

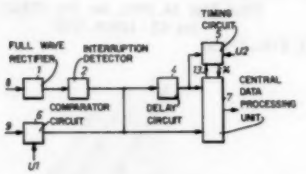
Per I. Holm, Alta; Karl F. L. Nyberg, Tyresö, and Ulf A. Södermark, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 29, 1981, Ser. No. 316,271

Claims priority, application Sweden, Nov. 6, 1980, 8007825

Int. Cl.³ G06F *11/00*; H04Q *1/22*

U.S. Cl. 179—18 EE **1 Claim**



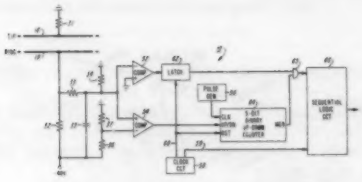
1. In a telephone exchange which includes a stored program controlled central processing unit and a stabilized AC/DC converter for generating an operating voltage, a method of processing faults resulting from transient suspensions in the operating voltage comprising sensing for a suspension in the operating voltage, in response to such suspension interrupting the execution of the program being performed by the stored program controlled central processing unit, measuring the duration of the suspension; if the duration is less than a given time initiating a first control sequence and if the duration is greater than said given time, initiating a second control sequence by the central processing unit.

4,429,185

VOLTAGE DETECTOR CIRCUIT

James M. Adrian, Naperville, and Victor H. Mitnick, Lisle, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1981, Ser. No. 332,551
Int. Cl.³ H03K 17/16; H04B 3/46; H04M 3/22
U.S. Cl. 179—18 FA 20 Claims



1. A circuit for detecting the presence between two terminals of a DC voltage above a predetermined reference level regardless of the presence between said terminals of an AC voltage of a substantially fixed period, said circuit comprising

comparator means for sensing instantaneous voltage between said two terminals and generating an up signal when said instantaneous voltage exceeds said predetermined reference level, and

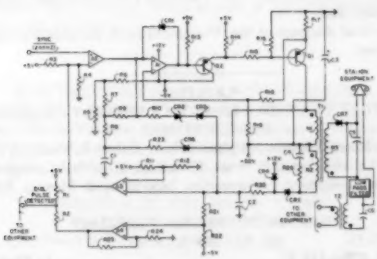
means responsive to said up signal for generating a voltage present signal when, over a time interval substantially equal to the product of a positive integer and said period, said comparator means has generated said up signal during more than one-half of said time interval.

4,429,186

FLOATING BATTERY FEED CIRCUIT FOR TELEPHONE SUBSCRIBER LINE INTERFACE

Todd H. Gartner, Elmhurst, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 30, 1982, Ser. No. 429,743
Int. Cl.³ H04M 19/00
U.S. Cl. 179—77 6 Claims



1. A circuit operated in synchronism with an external pulse source for supplying and monitoring direct current in a transformer isolated line comprising:

a transformer having an input winding and an output winding;

a capacitor connected across said output winding;

a rectifier connected between said output winding and said capacitor with said line connected across said capacitor for receiving an operating potential;

a pulse width voltage coverter operated in response to said pulse source to output a power pulse through said input winding; and

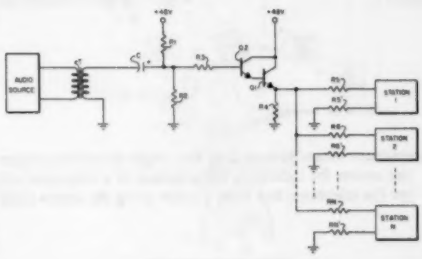
a first negative peak voltage detector connected to said input winding operated to condition said converter to increase the duration of said power pulse upon sensing a negative peak voltage below a predetermined level.

4,429,187

AUDIO DISTRIBUTING SYSTEM

James S. Butcher, Glendale Heights, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 24, 1981, Ser. No. 334,189
Int. Cl.³ H04M 1/21, 1/20
U.S. Cl. 179—81 R 4 Claims



1. An audio system including an audio program source, a plurality of key telephone stations each having a predetermined characteristic impedance, and means for distributing audio signals from said program source to said stations over a plurality of lines, each line associated with and connecting said distributing means to one of said stations, said distributing means comprising:

isolation means transferring signals received from said program source to said stations over said lines but inhibiting signals generated by any one of said stations from being transferred back to said program source or any other of said stations;

coupling means disposed between said program source and said isolation means, coupling audio signals from said audio source to said isolation means; and

said isolation means including a plurality of series circuits, each including a pair of equal value resistors and an associated one of said stations connected therebetween via said associated line, each of said pairs of resistors conducting signals to said station associated therewith from said coupling means while maintaining immunity from noise longitudinally induced in said associated line.

4,429,188

TELEPHONE CALL SCREENER

Thomas E. Allen, 91 N. Mar Vista Ave. #5, Pasadena, Calif. 91106

Filed Jun. 15, 1981, Ser. No. 273,618
Int. Cl.³ H04M 1/66
U.S. Cl. 179—84 C 21 Claims

1. Apparatus for screening telphone calls over a telephone line to a receiving telephone from an outside telephone havng a dial with selectable digits, comprising:

means for detecting an incoming telephone call on the telephone line;

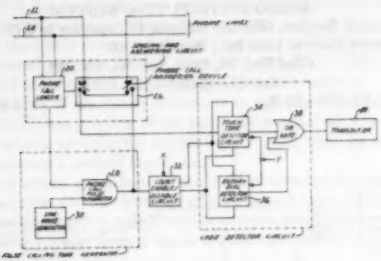
means responsive to an output from the detecting means for producing a sequence of false calling tones over the telephone line simulating the periodic audible calling tone of a conventional telephone;

means for receiving a first input generated by activating at least a selected one of the digits on the dial of the outside telephone only during a selected single silence gap in the false calling tone sequence;

means for producing a second input representative of a secret code;

means for comparing the second input with the received first

input for producing an output when the first input matches the second input; and



transducer means activated by the output from the comparing means for indicating the presence of a telephone call on the telephone line from a caller using the secret code.

4,429,189

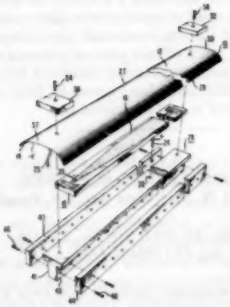
ELECTRET TRANSDUCER WITH A SELECTIVELY METALIZED BACKPLATE

David A. Berkley, New York, N.Y.; Ilene J. Busch-Vishniac, Highland Park, N.J.; Robert L. Wallace, Jr., Warren, N.J., and James E. West, Plainfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,667

Int. Cl.³ H04R *19/00*

U.S. Cl. 179—111 E **14 Claims**



9. A directional acoustic transducer comprising:

an insulated circuit board having a metallic coating on one side thereof;

an electrostatically charged electret foil having a first metallic layer and a second electret polymer layer superimposed on said insulated circuit board; and

a metal element adapted to support said insulated circuit board;

the width of said metallic coating being selectively varied to produce a transducer directional response having a mainlobe and a plurality of sidelobes, each sidelobe being at least a predetermined level below said mainlobe.

4,429,190

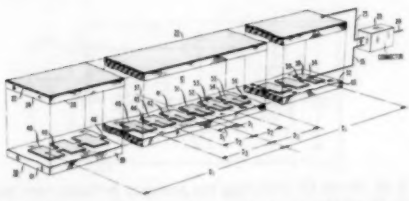
CONTINUOUS STRIP ELECTRET TRANSDUCER ARRAY

Christopher D. G. Stockbridge, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,668

Int. Cl.³ H04R *19/00*

U.S. Cl. 179—111 E **7 Claims**



1. An acoustic transducer for producing a directional response pattern comprising:

a backplate;

an electret foil superimposed directly on said backplate, the surface of said backplate being coated with a metal electrode, said metal electrode comprising a plurality of discrete areas interconnected by a plurality of thin strips, said discrete areas being located symmetrically on opposite sides of the center of said metal electrode, the distance between any of said discrete areas and said metal electrode center being given by the application of the recursive formulae:

$$D_i' = D_i - \Delta D_i$$

$$\Delta D_i = -2KR/(2\pi \text{Sin } J) \text{ Sin } (2\pi D_i \text{ Sin } J),$$

where,

R = response of said array,

K = $\Delta R/R$, desired fractional change in response,

ΔR = desired change in response,

J = angle between arriving incident sound and the normal to said array,

D_i = initial distance of the i^{th} element from the center of said array, and

D_i' = final distance of the i^{th} element from the center of said array.

4,429,191

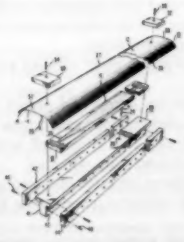
ELECTRET TRANSDUCER WITH VARIABLY CHARGED ELECTRET FOIL

Ilene J. Busch-Vishniac, Highland Park; Robert L. Wallace, Jr., Warren, and James E. West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,669

Int. Cl.³ H04R *19/00*

U.S. Cl. 179—111 E **11 Claims**



10. A directional acoustic transducer comprising:

an electret foil of predetermined length and width; and

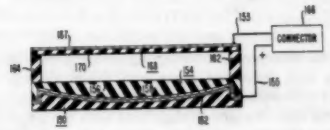
a metallized backplate for supporting said electret foil;
the electrostatic charge on said electret foil being selectively varied along the foil length symmetrically about its centerpoint to produce a transducer directional response pattern having a mainlobe surrounding said transducer with an axis of revolution along the length of said foil and a plurality of sidelobes in other directions, each sidelobe being at least a predetermined level below said mainlobe;
the electrostatic charge on said foil being uniform along the width of the foil at any point along its length.

4,429,192

ELECTRET TRANSDUCER WITH VARIABLE ELECTRET FOIL THICKNESS

Ilene J. Busch-Vishniac, Highland Park; Robert L. Wallace, Jr., Warren, and James E. West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,696
Int. Cl.³ H04R *19/00*
U.S. Cl. 179—111 E **10 Claims**



9. A directional acoustic transducer comprising: a backplate, one surface of said backplate being coated with a metal layer; a first electret foil having a metal layer surface, said metal layer surface of said first electret foil being substantially flat and said metal layer surface being fastened to said backplate so that the metal layer of said first electret foil is facing the metal layer coating of said backplate; and a second foil comprising a polymer layer and a metal layer, said second foil being suspended a distance from said first electret foil; the thickness of said first electret foil being selectively varied along the foil length symmetrically about its centerpoint to produce a transducer directional response pattern having a mainlobe and a plurality of sidelobes, each sidelobe being at least a predetermined level below said mainlobe.

4,429,193

ELECTRET TRANSDUCER WITH VARIABLE EFFECTIVE AIR GAP

Ilene J. Busch-Vishniac, Highland Park; Robert L. Wallace, Jr., Warren, and James E. West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,697
Int. Cl.³ H04R *19/00*
U.S. Cl. 179—111 E **11 Claims**

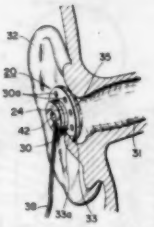
11. A directional acoustic transducer comprising:
a metalized backplate having a plurality of air spaces therein:
a single foil; and
a structure for supporting said backplate and said single foil;
the effective air gap in said transducer being varied by varying the air spaces in said backplate along the length thereof symmetrically about the backplate center to produce a directional response pattern comprising a mainlobe and a plurality of sidelobes substantially at a predetermined level below said mainlobe; and said single foil being constantly charged by a direct current bias.

4,429,194

EARPHONE

Yoshoyuki Kamon, and Yoshihiro Yokoyama, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 269,869
Claims priority, application Japan, Jun. 6, 1980, 55-79090[U]
Int. Cl.³ H04R *1/10*
U.S. Cl. 179—182 R **5 Claims**



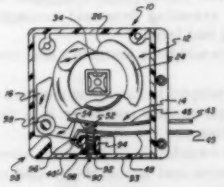
1. An earphone comprising a housing formed so as to be received in a recess of the concha, a magnetic circuit received in said housing, a diaphragm magnetically coupled to said magnetic circuit and with a diameter substantially equal to said housing and a flange formed around said housing for engaging lugs of the concha when said housing is received in the concha and wherein a protector having a plurality of openings is mounted on said flange to protect said diaphragm.

4,429,195

TIMING MECHANISM

Kenneth E. Deane, Beech Grove, and Robert S. Coulter, Plainfield, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 30, 1982, Ser. No. 373,519
Int. Cl.³ H01H *7/00*
U.S. Cl. 200—38 A **6 Claims**



1. A timing mechanism comprising:
(a) shaft means,
(b) a cam carried on said shaft means and coupling means coupling same to said shaft means for rotation therewith,
(c) spring means axially biasing said cam,
(d) a cam follower engaging said cam to be sequentially actuated in accordance with an axial displacement of said cam,
(e) a switch means responsive to said cam follower comprising a pair of movable electrical contact blades each of said blades including an electrical contact, and
(f) a dampening means disposed between and engaging one of said pair of movable electrical contact blades and a fixed member of said timing mechanism.

4,429,196

REVERSING SWITCH FOR MOTOR VEHICLE TRANSMISSION

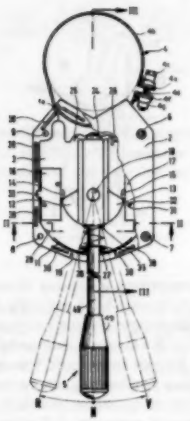
Willy Beig, and Günter Schwarz, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 307,946

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037578; Jul. 21, 1981, 3128752

Int. Cl.³ H01H 9/00

U.S. Cl. 200—61.54 8 Claims



1. A direction-selection switch for an electrohydraulic transmission comprising:

a housing;

a unitarily molded one-piece switching lever having a body received in said housing and formed with:

at least one pair of cams on opposite sides of said body,

an arm extending from said housing and actuatable to swing said lever,

means on said body journaling said lever on said housing, and

a guide adapted to receive an indexing member for releasably positioning said lever in a plurality of selected positions; and

respective switches in said housing connectable with said transmission and actuatable by said cams selectively in said positions, said journaling means including a pair of pins molded on said body and defining a pivot axis for said lever, said housing being formed by a pair of half shells joining at a parting plane and each having a bore receiving one of said pins, said housing being formed with a slot in an arcuate wall along said plane through which said arm extends, and

a shutter in the form of a sheet strip carried by said arm within said housing, sliding on said arcuate wall and sealing said slot in a dust-tight manner in all positions of said arm, said indexing member being a single ball aligned with said arm, said guide being formed as a bore receiving a compression spring and a disk biasing said ball against a further wall of said housing opposite said arcuate wall and formed with recesses in which said ball can be received.

4,429,197

VACUUM POWER INTERRUPTING DEVICE

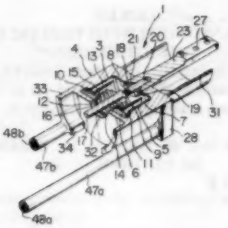
Shinzo Sakuma, Yokohama; Hifumi Yanagisawa, Sagamihara; Kazuo Tokuhata, Kanagawa, and Hiroshi Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha and Kabushiki Kaisha Gemvac, both of Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,855

Claims priority, application Japan, Dec. 15, 1979, 54-163851

Int. Cl.³ H01H 33/66

U.S. Cl. 200—144 B 6 Claims



1. A vacuum power interrupting device comprising an interrupting unit, including a vacuum vessel therein, said unit adapted to be mounted to a stationary structure, and an integral actuating unit arranged in alignment with the interrupting unit to actuate the interrupting operation of the interrupting unit so that a movable contact contacts a stationary contact or is spaced therefrom, wherein a vacuum interrupter includes a stationary contact rod aligned with a movable contact rod, each rod having an electrical contact provided on an end thereof extending within the vacuum vessel, and a supporting block formed of synthetic insulating resin material in which substantially the entire peripheral surface of the vacuum interrupter is embedded,

the improvement wherein said vacuum vessel comprises:

(a) a bell-shaped metal casing having an open end defined by a radially extending end portion, and

(b) a single insulating circular end plate, said metal casing being fitted over said end plate with the radially extending end portion of the casing hermetically brazed to an outer peripheral edge of one side of said end plate.

4,429,198

POWER SWITCHGEAR

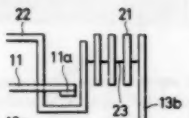
Teijiro Mori; Shigeru Masuda, both of Amagasaki; Hiroyuki Okado, Nagoya; Masahiro Kakizoe, Nagoya, and Yuji Sako, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,314

Claims priority, application Japan, May 20, 1981, 56-77409; May 20, 1981, 56-77410; May 20, 1981, 56-77411; May 20, 1981, 56-77412

Int. Cl.³ H01H 9/30

U.S. Cl. 200—144 R 9 Claims



1. In a power switchgear equipped with a fixed contact-

maker having a stationary contact, a moving contact arranged opposite to said stationary contact joined to a moving contact-maker, an arc runner and a commutating electrode arranged so as to face, when said contacts are closed, a side of said moving contact-maker opposite that to which said moving contact is joined, said moving contact, said arc runner and said commutating electrode being arranged such that the shortest distance between said commutating electrode and said arc runner is smaller than the shortest distance between said opposite side of said moving contact-maker and said arc runner when said contacts are moved apart, the improvement comprising:

at least a portion of said commutating electrode being positioned between a surface of the stationary contact and said opposite side of the moving contact-maker when a distance between said stationary contact and said moving contact is maximized, and having a hollow portion and a planar portion connected to said hollow portion and a deion grid facing said planar portion.

4,429,199

THREE-POLE CABLE CONNECTING UNIT FOR A THREE-POLE METAL-ENCAPSULATED, HIGH-VOLTAGE SWITCHING INSTALLATION

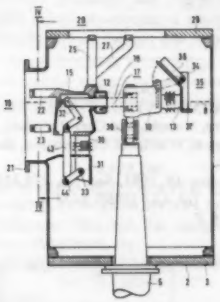
Christian Pircher, and Jürgen Schoeps, both of Berlin, Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,143

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126745

Int. Cl.³ H01H *33/54;* H02B *1/04*

U.S. Cl. 200—148 R **9 Claims**



1. A three-pole cable connecting unit for a three-pole metal encapsulated, compressed gas-insulated high voltage switching installation, comprising:

a housing having side and end walls and forming an encapsulation;

a three-pole isolating switch having three fixed and three movable contacts, all generally arranged in a switch plane, contact pins angled relative to one another respectively for selectively connecting pairs of fixed and movable contacts; and drive mechanisms for actuating the pins; three cable connecting elements introduced into the housing at an end wall thereof and respectively going to the fixed contacts of the switch, the elements being generally arranged in a plane which is parallel to a diametrical plane of the housing and perpendicular to the switch plane;

a first three-phase conductor branch leading out of a wall of the housing at a first connecting plane; and

a first set of three connecting conductors respectively leading from one of the fixed contact and moving contact of each contact pair to the first conductor branch, the first set of conductors fanning out so that at the first connecting plane, they lie relative to one another at the tips of a first equilateral triangle.

4,429,200

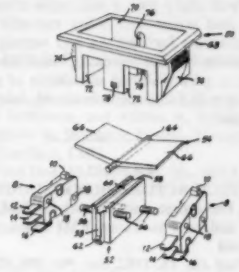
LOW COST, HIGH PERFORMANCE SWITCH ASSEMBLY

Robert L. Glenn, Arab, and Jackson H. Smith, Union Grove, both of Ala., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 430,649

Int. Cl.³ H01H *9/02*

U.S. Cl. 200—153 T **12 Claims**



1. An electrical switch assembly comprising in combination:

a pair of self-contained switch units having depressible operators;

a base member comprising an elongated upstanding rib disposed intermediate said switch units and means for positioning said switch units to said rib on laterally opposite sides thereof with said operators extending upwardly; and

actuator means formed integrally with said rib and extending laterally thereof in opposite directions to overlie said switch unit operators said actuator means being elastically deflectable along the lateral dimension for depressing said switch operators.

4,429,201

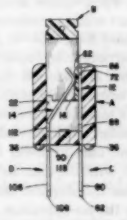
ELECTRICAL SWITCH HAVING A RECIPROCATING WIPING ACTUATOR

Leo P. Dekkers, Scituate, and James R. Spencer, Woburn, both of Mass., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 12, 1982, Ser. No. 348,659

Int. Cl.³ H01H *1/00*

U.S. Cl. 200—159 A **13 Claims**



1. A miniature switch, comprising: a housing including a cavity defined by a peripheral wall and a bottom wall connected with the peripheral wall, said peripheral wall providing opposed side surfaces within said cavity, the cavity being open at one end and being closed by said bottom wall of said housing at a longitudinally opposed end, said cavity being surrounded by said peripheral wall of said housing extending between said ends of said cavity, the bottom wall being perforated by mounting holes;

a pair of elongate electrical leads mounted in and passing

through the mounting holes and extending generally longitudinally from said bottom wall and toward said open end of said housing cavity, both of said leads having electrical contacts thereon, a first one of said leads being flexible between open and closed positions of said contacts; and

an actuator movably mounted for longitudinal reciprocation relative to said bottom wall through said open end and along said housing cavity for flexing said first one of said contacts between said open and closed positions, said actuator including a wiper wall and a pair of side walls connected by said wiper wall, said wiper wall being movable between and across said contacts for opening and wiping said contacts upon movement of said actuator, said side walls being spaced-apart to permit sliding movement of said side walls against said opposed side surfaces during said reciprocation of said actuator.

4,429,202

SWITCH ACTUATOR MECHANISM

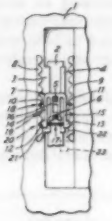
David C. Tedd, Folkestone, and Kenneth Gatland, Walmer, both of England, assignors to Thorn EMI Instruments Limited, Dover, England

Filed Jul. 15, 1982, Ser. No. 398,352

Claims priority, application United Kingdom, Jul. 16, 1981, 8121934

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—324 **4 Claims**



1. A switch actuator mechanism including a casing part having outwardly and inwardly facing surfaces, said part being formed with a slot, the said inwardly facing surface supporting first and second rack members extending respectively along opposing sides of said slot, said rack members being formed with respective cam surfaces disposed to face each other across said slot, a slider member formed with a part protruding outwardly through said slot for manual operation, said inwardly facing surface also supporting means to retain said slider member within said casing part while permitting said slider member to be moveable along said slot, and an actuator member secured to said slider and arranged to move therewith, the actuator member including first and second cam-follower members arranged to co-operate respectively with the first and second rack members to define a series of stable and unstable locations and cause said slider member to be moveable in steps along said slot, said first and second cam-follower members being resiliently urged into contact with the cam surfaces of their respective rack members so that the stepped movement of the slider member is controlled by the co-operation of the cam-followers with the cam surfaces of the rack members, and wherein a separate switch means is provided and positioned to be operable when said actuator member is moved beyond an extreme stable location, each of the rack members being formed, beyond the recess therein corresponding to said extreme stable location, with an inwardly sloping ramp arranged to force the respective cam-follower members inwardly against the resilient urge so that, the switch means having been actuated, the slider can be released and is automatically returned to said extreme stable location by the resilience applied to the cam-followers.

4,429,203

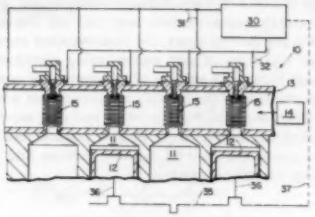
ELECTROMAGNETIC MICROWAVE DIELECTRIC HEATED STEAM FLASH PLUG

James L. Ramer, Rte. 1, Box 382, Whitestown, Ind. 46075

Filed Dec. 22, 1980, Ser. No. 219,038

Int. Cl.³ H05B *6/80, 6/54*

U.S. Cl. 219—10.55 A **8 Claims**



1. A steam flash plug comprising:

a. a non-electrically conductive tubular body having an open discharge end;

b. means for injecting water into said tubular body;

c. means for heating said tubular body with electromagentic microwave energy whereby said injected water is converted into steam when injected into said tubular body; and

d. a housing defining an expansion chamber having a movable element therein said expansion chamber having an open end coincident with said tubular body open discharge end whereby said expansion chamber physically expands in volume in response to forces which are generated by the steam and applied to said movable element.

4,429,204

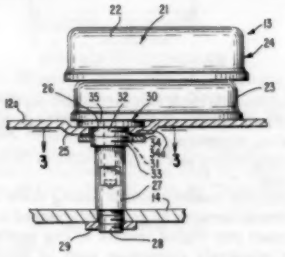
BUSHING MOUNTED STIRRER SHAFT

Howard R. McGuire, Nevada, and Carl R. Offutt, Marion, both of Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 19, 1981, Ser. No. 275,327

Int. Cl.³ H05B *6/74*

U.S. Cl. 219—10.55 F **13 Claims**



1. In a microwave oven having a painted cabinet defining a cavity for receiving food to be cooked therein and having a wall portion provided with a through opening forming a non-circular cross section, means for providing microwave energy to said cavity, a stirrer within said cavity for distributing said energy as it is provided to said cavity, and drive means exteriorly of said cavity for driving said stirrer, said drive means including a drive motor having an output drive shaft projecting through said opening in said wall portion and being connected to said stirrer, improved mounting means for mounting said motor to said wall portion and sealing said opening against leakage of microwave energy from said cavity outwardly therethrough, said mounting means comprising:

a bushing formed of electrically conductive material and defining a through passage providing a bearing surface for said shaft, and having a stem portion complementary to and fitted in said opening for nonrotative association with the cavity wall portion, said bushing further having a second threaded outer surface disposed within said cavity, and a head portion overlying an edge of said wall portion defining said through opening exteriorly of said cavity;

means fixedly securing the bushing to the drive means; and

retaining means within said cavity and threaded to said threaded outer surface of said bushing for forcibly clamping said edge of the wall portion between said bushing head portion and said retaining means for positively securing the bushing directly to the wall portion in electrically connected association for retaining said bushing and drive means carried thereby to said cavity wall portion.

4,429,205

INDUCTION HEATING APPARATUS

Karmen D. Cox, Lafayette, Ind., assignor to Roper Corporation, Kankakee, Ill.

Continuation of Ser. No. 116,300, Jan. 28, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,349

Int. Cl.³ H05B *6/06, 6/12*

U.S. Cl. 219—10.77 **30 Claims**

1. An induction heating apparatus having an inverter circuit including an induction heating coil coupled to a DC power supply for energizing the heating coil, the inverter circuit including a gate controlled rectifier for conducting current pulses of a first polarity through the heating coil, an oppositely poled diode coupled in parallel with the gate controlled rectifier for conducting current pulses of opposite polarity through the heating coil, a resistive-capacitive impedance connected in series with the diode which develops a voltage during conduction of the diode that is maintained for a time after conduction of the diode, means coupling said voltage to the gate of the gate controlled rectifier to provide gate reverse biasing for the rectifier during conduction of the diode and for said time after conduction.

4,429,206

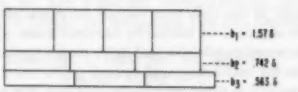
MINIMUM LOSS MULTILAYER ELECTRICAL WINDING FOR INDUCTION HEATING

Richard E. Kothmann, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1982, Ser. No. 358,558

Int. Cl.³ H05B *5/18*

U.S. Cl. 219—10.79 **7 Claims**



1. A multilayer electrical winding disposed about an axis, comprising:

at least two layers respectively including a first plurality of ampere turns in one of said layers and a second plurality of ampere turns in another of said layers;

the ampere turns of each plurality being formed with a single conductor having radially of said axis a common thickness and longitudinally of said axis a common width;

the common thicknesses and widths of said pluralities being selected to form respective monotone progressions in opposite directions as defined from the outside of said winding toward the inside thereof;

with the common thicknesses thereof being such that for the first layer b_i/δ has a value selected between 1.5 and 1.65; that for the second layer b_i/δ has a value selected between 0.65 and 0.8, where b_i is the layer thickness for the layer of rank i in said winding and δ is the effective depth of current penetration radially of said winding; and with the ratio w_i/w_1 being selected between 1.2 and 1.45, where w_1 is the width of the conductor in the first layer, and w_i is the width of the conductor of rank i;

thereby to minimize resistance and eddy current losses in said at least two windings;

with the conductors of two adjacent layers being connected at a common and adjacent end.

4,429,207

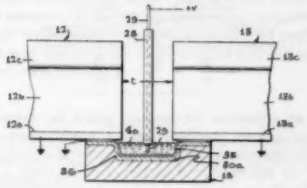
METHOD FOR WELDING RAILROAD RAILS AND MEANS THEREFOR

Jack H. Devletian, Portland; William E. Wood; Robert B. Turpin, both of Hillsboro, and Milton R. Scholl, Aloha, all of Oreg., assignors to Southern Pacific Transportation Company, San Francisco, Calif.

Filed Dec. 30, 1981, Ser. No. 335,812

Int. Cl.³ B23K *25/00*

U.S. Cl. 219—73.1 **16 Claims**



1. For use in welding ends of spaced-apart railroad rails by an electroslag welding process wherein mold-forming means are used to form a mold cavity, said mold-forming means including a pair of oppositely-positionable shoes which are contoured to be tightly clampable to the sides of said rails and further contoured to form sides of said weld cavity which includes the space between the ends of said spaced apart rails, a bottom member for forming the bottom of said well cavity, comprising:

a metal block defining a recess at the top thereof;

heat insulating means in said recess; and

a metallic insert lying on said heat insulating means and extending across the width of said cavity with said rails lying on said insert, said insert having a recess which forms the bottom of said weld cavity, the region immediately above said insert being free of obstruction to the insertion of a welding electrode so its tip can substantially touch said insert to form an arc between said electrode and said insert.

4. An electroslag welding process of the type wherein spaced apart metal parts are welded together by a metal weld, formed in weld cavity, into which filler metal is continuously provided, and wherein a slag bath is present and as a result of electrical power, applied between said filler metal which is in contact with said slag bath and the weld mold, the slag bath is maintained at a high temperature so that the filler metal, in contact therewith, melts and flows downwardly in said cavity, and as it cools it hardens to form said weld the steps comprising:

positioning in said weld cavity a guide tube structure, through which at least one metal electrode is continuously feedable into said cavity;

providing a bottom block forming the bottom part of said mold, said bottom block including a trough-shaped metallic insert extending across the width of the cavity and which is substantially heat insulated from the bottom block; and

applying electrical power between said electrode and said metal insert and establishing an arc between them, and continuously feeding said electrode into said cavity, whereby said insert and portions of the bottom structure

melt to form a layer of molten metal at the cavity bottom of substantially uniform temperature.

4,429,208

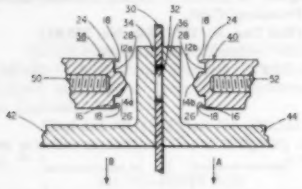
ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 934,046, Aug. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Sep. 14, 1981, Ser. No. 301,950

Int. Cl.³ B23K *11/30*

U.S. Cl. 219—78.16 **19 Claims**



1. In an apparatus having electrodes for extruding, in response to a force applied along a predetermined axis, and fusing, in response to an applied electrical current, lead parts through an aperture in a battery case to form a connection therethrough, an improved electrode comprising a centrally disposed extrusion portion; and means for limiting the degree of contact between the lead parts within said aperture prior to the application of said electrical current, operatively associated with said extrusion portion and forming part of said electrode.

4,429,209

RESISTANCE WELDING PIN

Milton Hinden, Massapequa, N.Y., assignor to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Oct. 19, 1981, Ser. No. 312,527

Int. Cl.³ B23K *9/20*

U.S. Cl. 219—98 **2 Claims**

1. A metallic welding pin for the attachment of insulative batts to a metallic substrate by resistance welding comprising, in combination, an axially directed shank portion having a sharpened tip at one end and an integral head at the other end, a washer member of greater external diameter than said head mounted over said shank and disposed at the junction of said head and shank, said pin being characterized in that said shank portion, along substantially the entire length thereof from said head to the junction of said shank and tip, includes a solid core portion surrounded by integral, axially spaced, radially outwardly extending fin portions, the outer diameter of said fin portions being from one third to three fifths greater than the outer diameter of said core, and the fin portion furthest from said head is located substantially at the junction of said shank and tip.

4,429,210

HEATING DEVICE

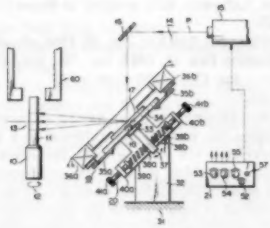
Shigeru Sudo, Tokyo, and Masaaki Yada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 21, 1981, Ser. No. 332,829

Claims priority, application Japan, Dec. 26, 1980, 55-185837

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LW **10 Claims**



1. A heating device for heating with a laser beam a predetermined range in the axial direction of an object to be heated having an axis, comprising:

a laser oscillator which emits a laser beam,

an optical guide member which guides the laser beam from said laser oscillator to the object to be heated,

support means for supporting said optical guide member to pivotally oscillate said optical guide member about an axis substantially perpendicular to the axis of the object to be heated, and

drive means for oscillating said optical guide member between a maximum titled position in a first rotational direction and a maximum tilted position in a second rotational direction opposite said first direction and for stopping said optical guide member at both maximum tilted positions for a predetermined period such that the laser beam which is incident on said optical guide member is reciprocally scanned in the axial direction of the predetermined range of the object to be heated by the oscillation of said optical guide member wherein said drive means further comprises means for oscillating said optical guide member between the maximum tilted position in said first direction and the maximum tilted position in the second direction and for stopping said optical guide member at both maximum tilted positions for a predetermined period, the stopping period at both maximum tilted positions being equal to or longer than a period of pivotal movement.

4,429,211

LASER PIPE WELDING SYSTEM FOR NONSTATIONARY PIPE

Jeffrey P. Carstens, South Glastonbury; Paul R. Blaszuk, Lebanon, and John S. Foley, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 2, 1982, Ser. No. 403,985

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LC **4 Claims**

1. A laser pipe welding system for welding pipe comprising:

at least one laser for generating a collimated optical beam along a first beam axis;

means for transporting said collimated optical beam to a focus head;

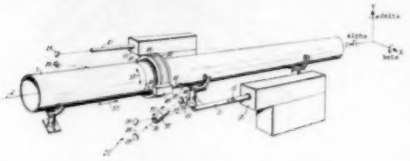
focus head means for focusing said collimated optical beam to a focal spot for welding said pipe;

driving means mounted on said pipe for rotating said focus head azimuthally about said pipe; and

seam tracking means for controlling said focus head to properly follow the correct welding path during said rotation of said focus head;

characterized in that:

said means for transporting said optical beam comprises a first turning mirror rotatably mounted along said first beam axis and oriented to deflect said beam along a second beam axis, said first mirror being mounted in first mounting means to rotate about said first beam axis;



a second turning mirror, rotatably mounted along said second beam axis and oriented to deflect said beam along a third beam axis, said second turning mirror being mounted in second mounting means to rotate about said second beam axis, which second mounting means is mounted to rotate about said first beam axis;

a third turning mirror, disposed along said third beam axis, for deflecting said beam along a fourth beam axis and being rotatably mounted in third mounting means to rotate about said fourth beam axis;

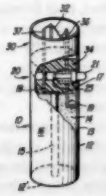
a fourth turning mirror disposed along said fourth beam axis for deflecting said beam along a fifth beam axis extending into said focus head means, said fourth turning mirror being mounted in fourth mounting means to rotate about said fifth axis, and said third mounting means being mounted to rotate about said fifth axis, whereby said beam is transported from said laser to said focus head means during motion of said focus head about said pipe.

4,429,212

DISPOSABLE ELECTRIC LIGHTER

Sam D. Mock, Jr., Rte. 1 Box 697, Smith's Station, Ala. 36877, and Curtis D. Mock, 119 Swimming Pen Dr., Doctor's Inlet, Fla. 32020

Filed Apr. 1, 1981, Ser. No. 249,921
Int. Cl.³ F23Q 7/16
U.S. Cl. 219—268 **4 Claims**



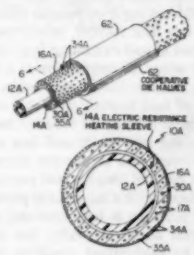
1. A disposable electric lighter comprising a casing of non-conductive thermoplastic material having one end closed and the opposite end open, the casing being monolithic and providing the outer covering for a source of electric energy placed in the closed end portion of the casing which electric energy source comprises zinc foil liner in contact with the inner surface of said casing over at least half the length of the casing, conventional alkaline battery composition within said foil and in electrical contact therewith and an electrode within said composition extending upwardly therethrough to the upper surface of said composition, a cap of non-conductive material sealing the upper surface with a recess in a portion of the top of said cap, a first contact element extending from said electrode upwardly through said cap and a second contact element extending from said foil liner upwardly through said cap and diametrally spaced from said first contact; and ignition assembly sealingly positioned in spaced relationship with said electrical energy source cap and below said open end of said casing, said assembly having two contact elements depending therefrom, one of said contact elements making electrical contact with said second contact element of said energy source, the other of said contacts being spaced from said first contact element of said energy source, the assembly further having a recess on a portion of its underside; and switching means positioned between said energy source cap and the underside of said ignition assembly in the respective recesses of said cap and said underside and adapted to be selectively placed in electrical contact with said energy source first contact and said assembly other contact simultaneously.

4,429,213

ELECTRICALLY HEATED FLUID CONDUIT

Julien C. Mathieu, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 953,282, Oct. 20, 1978, abandoned.
This application Feb. 21, 1980, Ser. No. 123,237
Int. Cl.³ H05B 3/40; F24H 1/14; F16L 11/12
U.S. Cl. 219—301 **2 Claims**



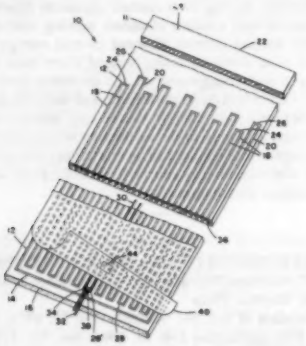
1. An electrically heated fluid-carrying conduit construction comprising a pipe adapted to contain said fluid, an electrical heater for heating said pipe disposed around said pipe and extending along the length thereof, and a thermal insulating material disposed around said heater, wherein said pipe consists of an electrically insulating synthetic plastic material, wherein said heater comprises a seamless sleeve of synthetic polymeric material having electrically conductive particles disposed substantially homogeneously therethrough, an electrical cable assembly having an electrical connector for connection to a power source and a pair of leads extending therefrom, a pair of electrically conductive bands fixed against said sleeve in spaced relation along a predetermined length thereof defining the length of said heater along said pipe, means for connecting one of said pair of leads to one of said pair of bands and means for connecting the other of said pair of leads to the other of said pair of bands; and wherein said insulating material consists of a seamless jacket of foamed synthetic plastic material having randomly disposed air pockets therethrough, wherein the outer portion of said jacket is in a more compacted condition than the inner portion of said jacket so that the air pockets immediately adjacent the outer periphery of said

jacket are of a size smaller than the air pockets immediately adjacent said heater, whereby said jacket has a higher density on the outside surface thereof for greater wear and impact resistance and good thermal insulating properties adjacent said pipe.

4,429,214
ELECTRICAL HEATING PANEL

Robert J. Brindley, Tonawanda; Salvatore R. Taravella, Buffalo, and Robert M. Dean, North Tonawanda, all of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Sep. 27, 1982, Ser. No. 424,115
Int. Cl.³ H05B 3/18, 3/28
U.S. Cl. 219—345 **8 Claims**

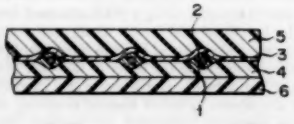


1. In an electrical radiant heating panel comprising a sheet of gypsum wallboard having a serpentine recess provided in and extending along one face thereof, an electrical resistance heating wire positioned in and extending lengthwise of said recess, non-heating lead wires for connection to a source of electrical current having a portion within said recess each connected to an opposite end of said heating wire and extending from said recess, filler material filling said recesses over said wire, and a paper sheet covering said wallboard face and said filling, the improvement wherein said serpentine recess comprises a plurality of elongate parallel longitudinal portions and connecting short lateral portions with a substantial portion of the connecting short lateral portions at least one end arranged in a staggered, non-aligned form, whereby the wallboard is made highly resistant to inadvertent cracking when lifted by the board ends.

4,429,215
PLANAR HEAT GENERATOR

Yoshio Sakai, Ueda, and Takeshi Yamada, Saku, both of Japan, assignors to Totoku Electric Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,376
Claims priority, application Japan, Mar. 27, 1981, 56-43546[U]
Int. Cl.³ H05B 3/34
U.S. Cl. 219—528 **4 Claims**

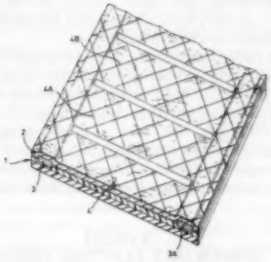


1. A planar heat generator comprising an electric linear heat generator provided with an insulating cover, a pair of insulating intermediate layers provided on opposite sides of said heat generator and heat sealed to each other via said heat generator, and a pair of outer insulating sheets provided on the outer sides of said respective intermediate layer and heat sealed to each other via said intermediate layers, said linear heat generator having terminals extending outside of said outer insulating sheets, said intermediate layers and outer insulating sheets being made of the same material, said insulating cover of said linear heat generator being made of a material having a slightly higher thermal deformation temperature than said intermediate layers and outer insulating sheets and flattened in a state covering said heat generator through plastic deformation caused by application of pressure and heat at the time of the heat seal.

4,429,216
CONDUCTIVE ELEMENT

Alan Brigham, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 102,621, Dec. 11, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,453
Int. Cl.³ H05B 3/16, 3/34
U.S. Cl. 219—528 **35 Claims**



1. An electrically conductive element which comprises
(a) a support which is a flexible continuous film of polymeric material; and
(b) randomly distributed fibers having first portions which protrude from the support and which have solid particulate electrically conductive material deposited thereon and adherent thereto, thus forming an electrically conductive layer, and second portions which are embedded in the support and are substantially free of electrically conductive material adherent thereto.

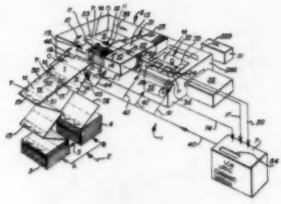
23. A process for the preparation of an electrically conductive element which comprises
(a) depositing a liquid composition comprising an aqueous dispersion of electrically conductive particles onto the protruding fibers of a substrate which comprises a support and randomly distributed fibers having first portions which protrude from the support and second portions which are embedded in the support, the support and the portions of the fibers embedded therein being substantially impervious to the liquid composition; and
(b) drying the aqueous dispersion.

4,429,217

VERIFYING INSERTION SYSTEM AND APPARATUS

James E. Hill, Prospect Heights; Baesley I. Dahlstrom, Des Plaines, and Robert D. Fisher, Melrose Park, all of Ill., assignors to Dynetics Engineering Corp., Wheeling, Ill.

Division of Ser. No. 832,001, Sep. 9, 1977, Pat. No. 4,194,685, which is a continuation-in-part of Ser. No. 768,446, Feb. 14, 1977, which is a division of Ser. No. 615,112, Sep. 19, 1975, Pat. No. 4,034,210. This application Jun. 15, 1979, Ser. No. 48,767
Claims priority, application Canada, Sep. 17, 1976, 261445; United Kingdom, Sep. 20, 1976, 38812/76
Int. Cl.³ G06K *5/00, 7/08;* B65B *11/48;* B65H *39/00*
U.S. Cl. 235—380 26 Claims



1. Apparatus for automatic verification and retentive engagement of a substantially ordered sequence of credit cards bearing cardholder or account information into association with a substantially ordered sequence of carriers bearing corresponding cardholder or account information, comprising:

(a) means for reading said information on said carriers,

(b) means for reading at least some of said information on the credit cards,

(c) means for comparing the information read from each of said carriers with that read from each of said cards to determine if there is a matching relationship, and

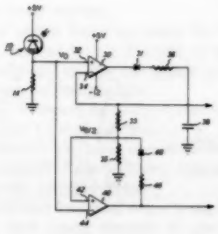
(d) means responsive to said comparing means for retainingly engaging each card after it is read into association with the carrier having a matching relationship.

4,429,218

SCANNING BEAM DETECTOR

Dale C. Thomas, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1981, Ser. No. 262,154
Int. Cl.³ H01V *40/14*
U.S. Cl. 250—214 R 12 Claims



1. Apparatus for detecting a scanning beam of radiant energy from a radiant energy source at a predetermined position along a scan path and for providing an indicator signal useful for the establishment of a start of scan position on a recording medium, said apparatus comprising:

(a) a photodiode assembly having a photodiode with a receiving surface and positioned at said predetermined position for detecting said beam and providing an output voltage when the receiving surface is irradiated by said beam;

(b) an operational amplifier having an inverting and a non-inverting input terminal and being configured as a voltage follower, the amplifier having the assembly output voltage coupled to its non-inverting input terminal with a feedback voltage coupled to the inverting input terminal, so that the amplifier output has unity gain and is in phase with said assembly output voltage;

(c) a RC filter for averaging the amplifier output;

(d) a diode being positioned between the amplifier and the RC filter to enable the capacitor in said filter to store the averaged amplifier output as a reference signal, said signal representing the average total power of the detected beam;

(e) a comparator having an inverting and a non-inverting input terminal and an output terminal, the assembly output voltage being coupled to the comparator inverting terminal; and

(f) a network circuit having voltage dividing resistors enabling 50 percent of the reference signal stored on said capacitor in the RC filter to be supplied to the comparator non-inverting terminal, so that the assembly output voltage is compared with 50 percent of the reference signal and, when the assembly output voltage decreases to the level of 50 percent of the reference signal, the comparator provides the indicator signal at its output terminal that is representative of the center position of the power distribution within said scanning beam.

4,429,219

APPARATUS FOR DETERMINING AND INDICATING THE POSITION OF A MOVABLE MEMBER

Billy G. Yochum, and G. James Keller, both of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 10, 1981, Ser. No. 252,840
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—229 11 Claims

1. Apparatus for determining the position of a movable member comprising:

first detector means defining a plurality of substantially parallel light paths arranged over a distance of D units and providing a first output indicative of which of said light paths are blocked;

first shutter means having alternate light obscuring and nonlight-obscuring regions, each D units in length, said first shutter means being movable through said light paths so as to affect said output of said first means and adapted to be coupled for movement with said movable member such that the position of said shutter is dependent upon the position of said movable member, and

second means for determining which of said light-obscuring or nonlight-obscuring regions are interposed in said light paths and are thus affecting said first output and for providing a second output in accordance therewith, whereby said first and second outputs together represent the posi-

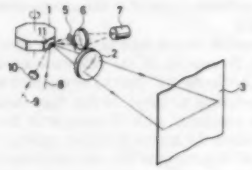
tion of said shutter means and thus of said movable member.

4,429,220

LIGHT BEAM SCANNING DEVICE WITH CURVED GRID PATTERN

Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 1, 1981, Ser. No. 259,623
Claims priority, application Japan, May 14, 1980, 55-63529
Int. Cl.³ H01J 3/14
U.S. Cl. 250—236 7 Claims



1. A light beam scanning device comprising: light beam providing means; light beam scanning means for reflecting a first portion of light incident thereon in a scanning plane; a grid pattern curved along a circle having a center coinciding with a deflection point from said scanning means, said grid pattern having transparent portions and opaque portions arranged alternately thereon; a second portion of said light incident on said scanning means being directed to said grid pattern, said transparent and opaque portions being arranged in the direction of deflection of said second portion of light incident on said grid pattern; and detector means for producing an output signal in response to light passing through said grid pattern.

4,429,221

METHOD FOR DETERMINING FLUID SATURATION CHARACTERISTICS OF SUBSURFACE FORMATIONS

Linus S. Allen, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,917
Int. Cl.³ G01V 5/00
U.S. Cl. 250—256 5 Claims

1. A method for normalizing the apparent water saturation condition of a subsurface formation determined from thermal neutron capture logs obtained during a log-inject-log operation in a borehole traversing the subsurface formation comprising the steps of:

(a) measuring the macroscopic absorption cross sections of hydrocarbon in the formations surrounding said borehole,

(b) determining the apparent macroscopic absorption cross section of a rock matrix in the formation surrounding the borehole from said apparent water saturation and said measured macroscopic absorption cross section of the hydrocarbon,

(c) measuring the real macroscopic absorption cross section of the rock matrix,

(d) determining a normalization factor relating to said apparent and measured macroscopic absorption cross sections for said rock matrix, and

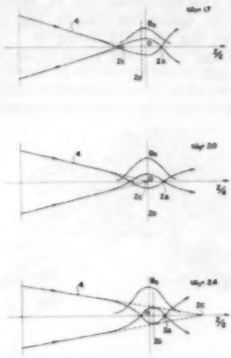
(e) applying said normalization factor to said apparent water saturation to correct for neutron diffusion and borehole effects on said thermal neutron capture logs.

4,429,222

TRANSMISSION ELECTRON MICROSCOPE

Akira Yonezawa, Fussa, Japan, assignor to International Precision Incorporated, Tokyo, Japan

Filed Jan. 8, 1981, Ser. No. 309,777
Claims priority, application Japan, Oct. 7, 1980, 55-139392
Int. Cl.³ H01J 37/26
U.S. Cl. 250—311 2 Claims



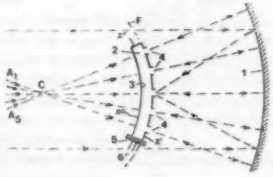
1. A transmission electron microscope, comprising an objective lens and a condenser lens which are so arranged that excitation of said condenser lens can be varied in association with variation in excitation of said objective lens, wherein a cross-over point which is produced by the condenser lens of the last stage in the non-excited state of said objective lens is caused to coincide with a preselected position on the optical axis of said microscope, which position is determined in accordance with magnitude of excitation of said objective lens, whereby the position of a convergence point of the electron beam formed downstream of a specimen to be observed is maintained substantially constant independently from variations in excitation of said objective lens.

4,429,223

INFRARED INTRUSION DETECTOR

Peter Wägli, Uetikon, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Filed Sep. 23, 1981, Ser. No. 305,032
Claims priority, application Switzerland, Oct. 24, 1980, 7926/80
Int. Cl.³ G01J 1/00
U.S. Cl. 250—342 14 Claims



1. An infrared intrusion detector comprising:

optical focusing means for focusing infrared radiation emanating from a number of separate receiving regions;

a sensor arrangement for receiving the infrared radiation received from said number of separate receiving regions in order to enable evaluation of the received radiation in the presence of a predetermined change thereof for purposes of giving an alarm signal;

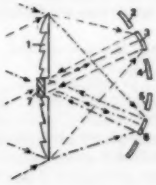
said focusing means containing a focusing surface;
said sensor arrangement comprising a substantially lengthwise extending radiation collecting element arranged at least approximately at the focusing surface of the focusing means;
said lengthwise extending radiation collecting element having surface means structured so as to be inwardly reflective;
said lengthwise extending radiation collecting element having a lengthwise extending side and an end;
said lengthwise extending side containing a plurality of radiation inlet openings; and
an infrared sensor element provided for said end of said radiation collecting element.

4,429,224

OPTICAL ARRANGEMENT FOR AN INFRARED INTRUSION DETECTOR

Peter Wägli, Uetikon; Alois Zetting, Herrliberg, and Gustav Pfister, Uerikon, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Oct. 13, 1981, Ser. No. 310,917
Claims priority, application Switzerland, Oct. 24, 1980, 7925/80
Int. Cl.³ G01J 1/00
U.S. Cl. 250—342 **17 Claims**



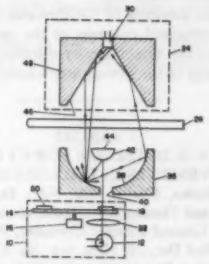
1. An optical arrangement for an infrared intrusion detector comprising:
at least one sensor element;
a plurality of optical focussing means for focussing infrared radiation received from a plurality of separate receiving regions upon said at least one sensor element;
a first common focussing means;
said plurality of optical focussing means comprising a number of further focussing means;
said first common focussing means directing the radiation incident from all of the receiving regions upon said number of further focussing means;
each of said further focussing means being operatively correlated for each sensor element to one of the receiving regions;
the number of further focussing means corresponding to the number of receiving regions per sensor element; and
said further focussing means being constructed and arranged such that the radiation arriving from each receiving region is focussed by the first common focussing means and then by the operatively correlated further focussing means upon the sensor element.

4,429,225

INFRARED THICKNESS MEASURING DEVICE

Takabumi Fumoto, Yokosuka, and Mutsuo Sawaguchi, Sagamihara, both of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 29, 1981, Ser. No. 268,231
Claims priority, application Japan, May 30, 1980, 55-71504; Dec. 17, 1980, 55-177184
Int. Cl.³ G01J 1/00
U.S. Cl. 250—353 **4 Claims**



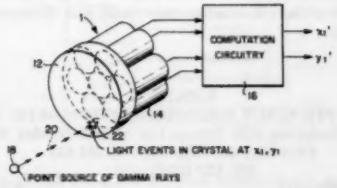
1. A device for measuring the thickness of a thin film or the like comprising:
a source of infrared rays positioned on one side of said film;
a disk with at least two apertures rotatably mounted between said infrared source and said film;
band-pass filters disposed over said apertures in said disk for filtering said infrared rays;
a concave, hemispherical reflector with a reflector surface facing said film and having a hole therein and positioned between said infrared source and said film whereby said infrared rays pass through said hole;
a convex reflector positioned between said film and said concave reflector and having a convex reflecting surface facing said concave reflector; and
a light collecting guide with means for sensing said infrared rays, said light collecting guide having a conical reflecting surface and being positioned on the opposite side of said film from said infrared source, said infrared sensing means being positioned at the apex of said conical reflecting surface.

4,429,226

METHOD OF AND MEANS FOR IMPROVING THE RESOLUTION OF A GAMMA CAMERA

Dan Inbar, Haifa, Israel, assignor to Elscint, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 149,335, May 13, 1980. This application May 12, 1982, Ser. No. 377,367
Int. Cl.³ G01T 1/20
U.S. Cl. 250—363 S **28 Claims**



1. In a gamma camera having a scintillation crystal responsive to radiation stimuli for producing light events at locations where the stimuli interact with the crystal, an array of photomultipliers responsive to a light event for producing individual

outputs, circuitry responsive to said outputs for identifying the elemental area of the crystal within which an event occurs, and a matrix whose elements are in one-to-one correspondence with elemental areas of the crystal, the contents of each element in the matrix being incremented when identified by the circuitry and representing the number of events that have occurred within a predetermined period of time within an elemental area of the crystal corresponding to the location of the element in the matrix whereby the contents of the matrix represents the density distribution of light events in the crystal, the improvement comprising:

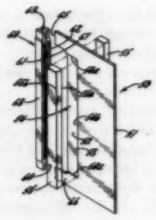
weighting the contents of the elements in the matrix such that the weighted contents of the matrix more closely approaches the actual density distribution of light events as compared to the unweighted contents of the matrix.

4,429,227

SOLID STATE DETECTOR FOR CT COMPRISING IMPROVEMENTS IN COLLIMATOR PLATES

Frank A. DiBianca, Chapel Hill, N.C.; Dennis H. Pritzkow, New Berlin, and Thomas E. Peterson, Greendale, both of Wis., assignors to General Electric Company, Waukesha, Wis.

Filed Dec. 28, 1981, Ser. No. 335,183
Int. Cl.³ A61B 6/00; G01T 1/20
U.S. Cl. 250—367 **8 Claims**



1. In a scintillation detector for a X-ray scanner, the improvement comprising a scintillator, a collimator plate having a narrow pocket formed in at least one face thereof, the pocket being dimensioned to receive the scintillator and having a protective wall shielding the longitudinal corner of the scintillator to prevent X-radiation from impinging on said corner or bypassing said scintillator.

4. In a scintillation detector for a X-ray scanner, the improvement comprising a collimator plate carrying a scintillator on each face thereof, a photosensor having a base support and a first and second active surface carried on said base support, the active surfaces being spaced by about the thickness of the collimator plate and having a rectangular shape about the same as the scintillator face, the collimator plate having a pair of opposed legs, and the base support having a pair of opposed slots dimensioned to receive said legs for supporting each of said active surfaces in accurate registration with the associated scintillator.

4,429,228

HIGH EFFICIENCY PHOTOIONIZATION DETECTOR

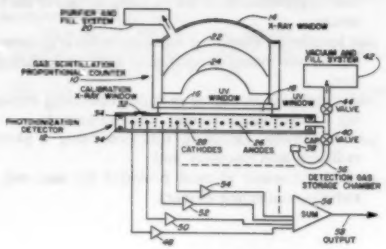
David F. Anderson, 3055 Trinity, Los Alamos, N. Mex. 87544

Filed May 12, 1981, Ser. No. 262,833
Int. Cl.³ G01T 1/18
U.S. Cl. 250—374 **9 Claims**

8. A device for detecting x-rays comprising:

gas scintillation proportional counter means for generating ultraviolet photons in response to said x-rays;

photoionization detector means disposed proximate to said gas scintillation proportional counter for converting said ultraviolet photons generated by said gas scintillation proportional counter to electrons using a detection gas



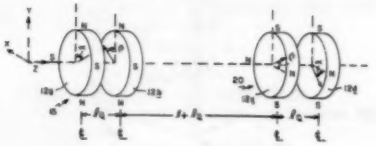
comprising at least in part tetrakis(dimethylamino) ethylene.

4,429,229

VARIABLE STRENGTH FOCUSING OF PERMANENT MAGNET QUADRUPOLES WHILE ELIMINATING X-Y COUPLING

Robert L. Gluckstern, Hyattsville, Md., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Aug. 26, 1981, Ser. No. 296,550
Int. Cl.³ G21K 1/08; H01F 1/00; H01J 3/24
U.S. Cl. 250—396 ML **10 Claims**



1. A variable strength permanent magnet quadrupole doublet comprising two quadrupoles, spaced a distance l apart, each quadrupole comprising two disks, each disk consisting of a plurality of segments of an oriented, anisotropic permanent magnet material arranged in a ring so that there is a substantially continuous ring of permanent magnet material, each segment having a predetermined easy axis orientation within a plane perpendicular to the axis of said disk; one quadrupole being rotated 90° with respect to the other quadrupole; means for rotating the two inner disks of the two quadrupoles an angle $-\beta$; and means for rotating the two outer disks of the two quadrupoles an angle α wherein α and β are determined at any particular position by the following relationships:

$$\tan \phi = \frac{l_Q}{l + 2l_Q} \tan \chi$$

$\chi = \alpha + \beta$, and

$\phi = \beta - \alpha$;

l_Q = thickness of the disk

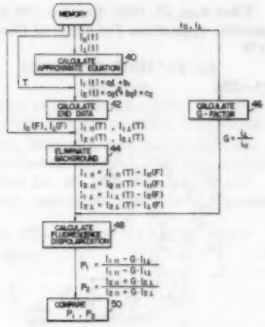
thereby varying the strength of the quadrupole doublet while eliminating coupling in the transverse directions.

4,429,230

FLUORESCENCE POLARIZATION ANALYZER

Tadashi Honkawa, Mito; Fujiya Takahata, Katsuta; Koichi Yagai, Mito; Yoshio Maeda, and Tetuya Shinden, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,413
Claims priority, application Japan, Dec. 26, 1980, 55-183836
Int. Cl.³ G01N *21/64*
U.S. Cl. 250—461.2 5 Claims



1. A fluorescence polarization analyzer comprising:

means for irradiating a polarized exciting light to a sample;

means for detecting a component of a predetermined polarization direction of fluorescence emitted from said sample;

first processing means for determining an approximate linear line based on data in a selected time period detected by said detection means and calculating a data at a predetermined future time based on said approximate line; and

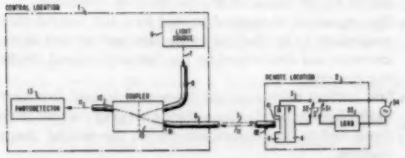
second processing means for determining an approximate curve based on said data in said selected time period detected by said detecting means and calculating a data at said predetermined future time based on said approximate curve.

4,429,231

OPTICAL SYSTEM FOR INTERROGATION OF THE STATUS OF A SWITCH

Bernard C. De Loach, Jr., New Providence; Richard C. Miller, Summit, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 25, 1981, Ser. No. 324,802
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 8 Claims



1. A system for interrogating the ON-OFF condition of an electrical switch comprising:

(a) a semiconductor body containing a PN junction;

(b) electrically conductive connection means adapted for connecting the electrical switch across the PN junction;

(c) a source of optical radiation of a first wavelength optically coupled to the semiconductor body; and

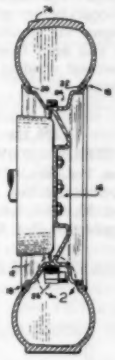
(d) photoelectric means, optically coupled to the semiconductor body, for discriminating and detecting radiation of a second wavelength, a substantial amount of the radiation of the second wavelength being emitted from the semiconductor body in response to incidence thereon of the first wavelength when the electrical switch is in the OFF condition, but not emitted when the switch is in the ON condition.

4,429,232

APPARATUS FOR GENERATING ELECTRICITY WITHIN A PNEUMATIC WHEEL ASSEMBLY

Stephen E. Thomas, 4015 Heron Pl., Fremont, Calif. 94536, and Mark S. Thomas, 3770 Flora Vista #403, Santa Clara, Calif. 95051

Filed May 24, 1982, Ser. No. 381,191
Int. Cl.³ F21L *13/00*; B60C *23/06*
U.S. Cl. 290—1 R 10 Claims



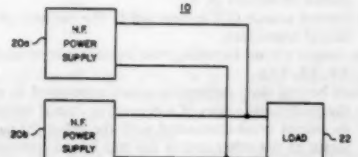
1. An apparatus for generating electricity within a pneumatic wheel assembly including a wheel having a relieved circumferential surface, and a tire mounted on said wheel, said apparatus comprising: a circular track attached to said relieved circumferential surface; a carriage coupled to said track; a generator supported by said carriage; and clutch means coupling said generator to said track.

4,429,233

SYNCHRONIZING CIRCUIT FOR USE IN PARALLELED HIGH FREQUENCY POWER SUPPLIES

Neil A. Kammiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Sep. 28, 1982, Ser. No. 425,328
Int. Cl.³ H02J *3/08*
U.S. Cl. 307—87 9 Claims



1. A circuit for use in a power supply of the type which includes an oscillator means having a predetermined time-out for generating a high frequency signal which is used by said power supply to derive one or more signals to drive the one or more power switching devices included in said supply said circuit allowing said supply and at least one other supply of said type which includes said circuit to be operated in synchro-

nism when connected in parallel across a load, said circuit comprising:

(a) transformer means having a first winding connected in parallel with another first winding of said transformer means in said circuit included in said at least one other paralleled supply and having a second winding across which a synchronizing signal appears; and

(b) conduction means responsive to said synchronizing signal for connecting said synchronizing signal to said oscillator means and responsive to said high frequency signal for connecting said high frequency signal to said second winding said oscillator means generating said high frequency signal in response to said synchronizing signal when said synchronizing signal occurs in time before said predetermined time-out said synchronizing signal being received on said first winding and said oscillator means generating said high frequency signal when said predetermined time-out occurs before said first winding receives a synchronizing signal the conduction of said conduction means allowing said high frequency signal to be connected to said second winding to thereby become said synchronizing signal.

4,429,234

THRESHOLD SWITCH

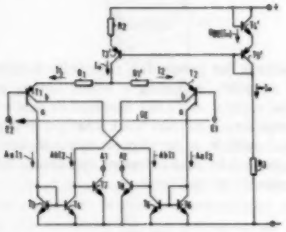
Klaus Streit, Tübingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,755

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045366

Int. Cl.³ H03K *5/153*

U.S. Cl. 307—350 **18 Claims**



1. Threshold switching circuit to provide an output signal (A1–A2) when an input signal (E1–E2) exceeds a predetermined threshold level comprising

a difference amplifier including two lateral pnp transistors (T1, T2) connected in a differential circuit,

the emitters of said lateral transistors being galvanically interconnected,

the two pnp lateral transistors (T1, T2) having, each, two partial collectors (a, b);

a current source (I_0), connected to the emitters of the two lateral transistors;

an output circuit including two current mirror circuits (T3, T4; T5, T6);

each having their respective inputs connected to one (a) of the partial collectors of a respective lateral transistor and its output cross-connected with the other (b) partial collector of the other one of the pnp lateral transistors;

an output coupling circuit additionally connected to the outputs of the current mirror circuits;

wherein the two partial collectors (a, b) of said lateral transistors (T1, T2) are of unequal dimension to provide for unequal conduction characteristics of the respective transistors for rendering the output of said transistors asymmetrical with respect to each other,

the non-equality defining the response threshold level, the unequal conduction characteristics of said transistors resulting in unequal conduction of said transistors in dependence on the level of the input signal with respect to the threshold level, and hence generation of an output signal representative of the level of the input signal with respect to said threshold level.

4,429,235

INPUT STAGE FOR AN IGNITION CONTROL CIRCUIT

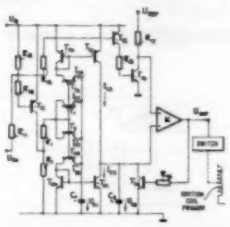
Willy Minner, Schwaigern, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,583

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034176

Int. Cl.³ H03K *5/01, 5/153*

U.S. Cl. 307—356 **6 Claims**



1. An input stage for an ignition control circuit for generating a cyclic output signal in response to a cyclic control signal composed of a train of pulses supplied to said input stage, the output signal serving for switching on and off the current to the primary winding of an ignition coil, said input stage comprising:

an inverter connected to receive the control signal for producing an inverter output signal which is an inverted version of the control signal;

a first current multiplier for producing first and second charging currents;

a second current multiplier for producing first and second discharging currents;

said first and second current multipliers being connected to said inverter to be controlled by the inverter output signal in a manner such that the charging currents are produced in alternation with the discharging currents at the repetition rate of the cyclic control signal;

means defining a charging resistance having a selected value and a discharging resistance having a selected value connected to said first and second current multipliers for causing the amplitude of the first charging current to be determined by the value of the charging resistance and the amplitude of the first discharging current to be determined by the value of the discharging resistance;

a first capacitor connected to said first and second current multipliers to be charged by the first and second charging currents and discharged by the first and second discharging currents;

a first current mirror circuit connected to said first current multiplier for producing a third charging current derived from, and in time coincidence with, the second charging current;

a second current mirror circuit connected to said second current multiplier for producing a third discharging current derived from, and in time coincidence with, the second discharging current;

a second capacitor connected to said first and second mirror circuits to be charged by the third charging current simultaneously with the charging of said first capacitor and to be discharged by the third discharging current simultaneously with the discharging of said first capacitor;

means connected to receive the control signal for periodi-

cally producing a reference voltage at the repetition rate of the control signal;

a comparator having inputs connected to receive the voltage across said second capacitor and the reference voltage, and having an output providing the cyclic output signal as a function of the relation between the voltages at its said inputs; and

means connected between said comparator output and said second capacitor for effecting discharging of said second capacitor under control of the output signal.

4,429,236

APPARATUS FOR GENERATING PULSES UPON DECREASES IN SUPPLY VOLTAGE

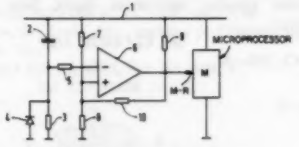
Werner Nitschke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,406

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035896

Int. Cl.³ H03K *5/153;* **G01R** *19/165*

U.S. Cl. 307—362 **9 Claims**



1. Apparatus for generating a pulse in response to excessive changes in the output of an electrical power supply having two terminals forming a line terminal (1) and a reference terminal, comprising

a differential amplifier means (6) having a first (+) and second (−) input and an output from which the pulse is derived;

feedback circuit means (10) connected from said output of the differential amplifier means (6) to said first input of said amplifier means;

voltage divider means (7, 8) connected across the terminals of said power suply and having a voltage divider tap connected to said first input of said differential amplifier means (6);

a capacitor (2) connected to one terminal of said power supply and to said second input of said amplifier means;

a resistor (3) connected jointly to said capacitor and also to the second input of said amplifier means, and further to the other terminal of said power supply to permit charging of the capacitor (2) therethrough upon application of supply voltage to said terminals; and

a diode junction (4) having a forward voltage drop connected in parallel with said resistor (3),

the voltage divider means (7,8) applying a voltage to said first input of said differential amplifier means which balances the voltage applied to said second input of the differential amplifier means under charged conditions of the capacitor (2),

drop of voltage of the power suply by an amount in excess of the forward voltage drop across the diode junction permitting discharge of the capacitor (2) through the diode junction (4) causing unbalance of the voltages at the first and second inputs of the differential amplifier means and switch-over of said differential amplifier means and generation of said pulse.

4,429,237

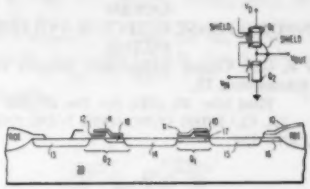
HIGH VOLTAGE ON CHIP FET DRIVER

Hayden C. Cranford, Jr., Apex; Charles R. Hoffman, Raleigh, and Geoffrey B. Stephens, Cary, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,802

Int. Cl.³ G03K *17/10, 17/687*

U.S. Cl. 307—450 **14 Claims**



1. An FET inverter comprising

a pair of series connected FET's, each with drain, source and gate terminals, an input terminal connected to a gate terminal of one of said FET's and an output terminal connected to a node common to drain of said one FET and source of said other FET,

said one FET having a shield surrounding its drain and overlying a portion of a channel between source and drain comprising a depletion channel,

said other FET having shields surrounding both source and drain, said source shield connected in common to said output terminal and said drain shield of said one FET, said drain shield of said other FET coupled to a potential substantially equal to a potential coupled to said other FET drain terminal.

4,429,238

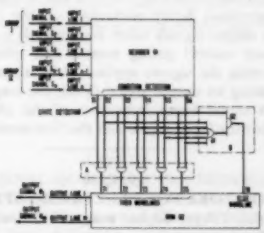
STRUCTURED LOGIC ARRAY

Marc L. Harrison, Morganville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 14, 1981, Ser. No. 292,840

Int. Cl.³ H03K *19/173, 19/177;* **G06F** *9/00*

U.S. Cl. 307—465 **7 Claims**



1. A programmed logic array for processing binary input signals to produce binary output signals comprising:

a first logic array having a plurality of input lines for receiving said binary input signals;

a second logic array having a plurality of output lines on which said binary output signals emanate;

a first plurality of wordlines, including CONDITION DETECTION wordlines, which emanate from said first array;

a second plurality of wordlines, including THEN wordlines and an ELSE wordline, which enter into said second array; and

combinatorial logic for receiving binary signals emanating from said first array on said first plurality of wordlines

before said binary signals emanating from said first array enter said second array on said second plurality of wordlines, and for delivering to the ELSE wordline a signal of predetermined first binary level only if the signals on all the CONDITION DETECTION wordlines are of a predetermined second binary level so that said programmed logic array implements a CASE statement.

4,429,239

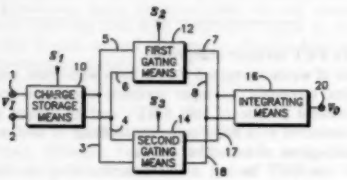
COMBINED PHASE DETECTOR AND LOW PASS FILTER

Michael J. Gay, Coppet, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 15, 1982, Ser. No. 357,948

Int. Cl.³ H03H *11/00*; H03K *5/159, 5/00*

U.S. Cl. 307—520 **18 Claims**



1. A combined phase detector and low pass filter comprising:

charge storage means (10) responsive to an input signal and to a first control signal, said first control signal having a first frequency;

first gating means (12) coupled to the charge storage means output signals for gating or blocking such signals in response to a second control signal;

second gating means (14) coupled to the charge storage means output signals for gating or blocking such signals in response to a third control signal, said second and third control signals being 180 degrees out of phase with respect to each other; and

integrating means (16) having first and second input terminals coupled to each of said first and second gating means said terminals being responsive to the charge storage means output signals when such signals are gated by the first and second gating means, said integrating means integrating the signals applied to its input terminals and generating an output signal (VO), the magnitude of said output signal being indicative of the phase difference between the input signal and the first control signal.

4,429,240

STATOR YOKE FOR ELECTRICAL APPARATUS

Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

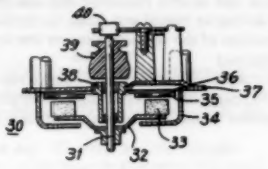
Filed Sep. 19, 1978, Ser. No. 943,747

Claims priority, application Japan, Sep. 21, 1977, 52-112572; Dec. 22, 1977, 52-171962

Int. Cl.³ H02K *15/12*

U.S. Cl. 310—45 **2 Claims**

1. In a DC brushless motor; a rotor carrying rotor magnets; a stator yoke comprising a layer of insulating material of a predetermined thickness, a layer of magnetically permeable material, and means bonding said layers to each other in superposed relation; wherein said layer of insulating material includes a cloth-like material and a cured adhesive filling interstices of said cloth-like material to form an insulator having a desired thickness and constituting said means bonding said layers to each other; means mounting said stator yoke and said rotor for rotation relative to each other with said layer of insulating material facing toward said rotor magnets and said layer of magnetically permeable material providing a path for magnetic flux between said rotor magnets; and stator coil



means bonded to said stator yoke on said layer of insulating material and being interposed in said path of the magnetic flux.

4,429,241

RADIO NOISE SUPPRESSION DEVICE FOR A COMMUTATOR MOTOR

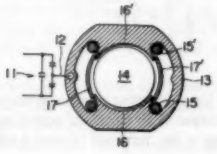
Takezi Ohara, Fuchi, and Yasuhisa Kodama, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed May 30, 1979, Ser. No. 43,960

Claims priority, application Japan, May 31, 1978, 53-74902[U]

Int. Cl.³ H02K *5/24*

U.S. Cl. 310—51 **4 Claims**



1. In a commutator motor having radio noise preventing capacitors, a common ground terminal of which is connected to a stator core of said commutator motor, said stator core being capacitively coupled to the armature of said motor, an improvement characterized in that:

a pair of non-magnetic metal pieces are provided to bridge between edge portions of stator poles of said commutator motor in opposing relation, so that said non-magnetic metal pieces surround an armature of said commutator motor with said stator poles, to thereby increase the capacitive coupling between said stator core and said armature.

4,429,242

ARRANGEMENT OF ACTUAL VALUE INDICATOR

Hans-Dieter Layh, Zachersweg 17, 71721 Gemmrigheim, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,169

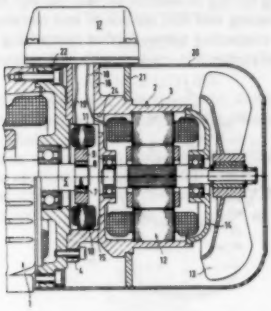
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122655

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—71 **15 Claims**

1. An arrangement of an actual value indicator for variable-speed drives, particularly for use in connection with an electrical motor having a motor housing and a driving shaft, comprising a hermetically closed adapter housing for accommodating an actual value indicator, said adapter housing being connectable to said motor housing around said driving shaft, a radially

directed tubular connecting piece formed on said adapter housing for receiving connecting cables leading from said



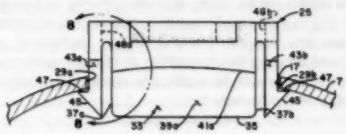
actual value indicator, and a terminal box arranged on the free end of said connecting piece for interconnecting said cables.

4,429,243

COMPARTMENTIZED LEAD WIRE TERMINAL HOUSING FOR ELECTRIC MOTOR

William D. Crow, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 22, 1982, Ser. No. 400,747
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **9 Claims**



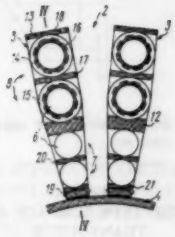
1. In a dynamoelectric machine comprising a stator and a rotor, said stator having a winding therein, a shell surrounding said winding, at least one terminal connected to said winding for the electrical connection of a selected electrical lead to said winding, an opening in said shell, wherein the improvement of this invention comprises: a terminal housing installable in said opening in said shell, said housing comprising a receptacle and a cover, said receptacle being received within said opening and having at least one compartment therewithin, said compartment having a base wall with a slot therein for receiving a respective said terminal, said receptacle having a pair of fingers, one at opposite sides thereof, attached to the upper portion of said receptacle and spaced from its respective adjacent sidewall of the receptacle, said fingers having retaining means engageable with said shell when said receptacle is installed within said opening thereby to prevent removal of said receptacle from said opening, said fingers being flexibly movable between a retaining position in which said retaining means is engageable with said shell and a retracted position in which said receptacle may be readily inserted within said opening, said cover having a base, a lid hingedly attached to said base, said lid being movable between an open position in which access may be had to said compartments within said receptacle and a closed position in which said lid overlies said compartments within said receptacle, said receptacle having a pair of apertures therein, one aperture adjacent each of said fingers, said cover base having a pair of lugs carried thereby insertable into said apertures after said receptacle has been inserted into said opening thereby to maintain said fingers in their retaining positions and for positioning said cover on said receptacle.

4,429,244

STATOR OF GENERATOR

Pavel Z. Nikitin; Tibor M. Nemeni; Lev A. Zolotov; Gennady A. Bezchastnov; Alexandr I. Nikolsky; Andrei M. Sharashkin, and Albert V. Tjurin, all of Moscow, U.S.S.R., assignors to Vsesojuzny Proektnoizyskatelsky I Nauchno-Issledovatelsky Institut "Gidroproekt", Moscow, U.S.S.R.

PCT No. PCT/SU80/00172, § 371 Date Jul. 16, 1981, § 102(e) Date Jul. 16, 1981, PCT Pub. No. WO81/01775, PCT Pub. Date Jun. 25, 1981
PCT Filed Sep. 29, 1980, Ser. No. 285,106
Claims priority, application U.S.S.R., Dec. 6, 1979, 2843451
Int. Cl.³ H02K *1/12*
U.S. Cl. 310—254 **8 Claims**



1. A stator of a generator, comprising a housing accommodating a slotted magnetic core of laminated steel, a dielectric oil-separating cylinder arranged next to the internal surface of said magnetic core, and a winding composed of high-voltage elements divided by spacers, arranged in the slots and secured by wedges, characterized in that the winding is made of two half-windings **7**, **8** placed in series and separated by an oil-separating spacer **12**, the high-voltage elements **6** of one of the half-windings, arranged in the stator slots, being accommodated in insulation sleeves **14** having hollow projections **15** on the internal surfaces thereof with a thermosetting compound placed between said hollow projections, the part of each insulation sleeve **14**, which extends beyond the stator slot, having a cylindrical portion **22** and a cone-shaped cable-type termination **23** of a predetermined size, reinforced with current-carrying layers **24**, said cylindrical portion being integral with said cable-type termination.

4,429,245

EXTERNAL ROTOR PRODUCTION FOR SYNCHRONOUS HYSTERESIS MOTOR

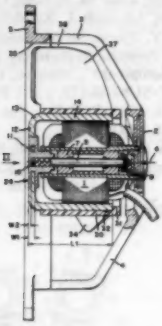
Siegfried Müller, St. Georgen, and Günter Wrobel, Villingen, both of Fed. Rep. of Germany, assignors to Papst Motoren GmbH & Co., KG, St. Georgen, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,632
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043558
Int. Cl.³ H02K *5/16, 1/22*
U.S. Cl. 310—261 **20 Claims**

1. External rotor electric motor comprising a stator providing a rotating electromagnetic field; a deep-drawn rotation symmetrical rotor pot of steel having a jacket part being a hysteresis ring and surrounding the stator coaxially and having a bottom part which is provided with a center hole, where the steel of the rotor pot includes the following minor components:

0.95 to 1.1 weight percent carbon,
0.15 to 0.35 weight percent silicon,
0.25 to 0.4 weight percent manganese,
1.35 to 1.65 weight percent chromium;

an end shield die cast into the bottom hole of the rotor pot; and



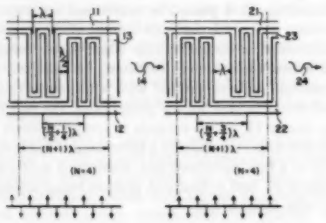
a shaft set into the end shield for supporting the rotary motion of the rotor pot.

4,429,246

GROUP-ARRANGED TYPE SURFACE ACOUSTIC WAVE TRANSDUCER

Hajime Miyajima, Sakado, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,839
Claims priority, application Japan, Dec. 18, 1980, 55-179173
Int. Cl.³ H03H *9/02*; H01L *41/00*
U.S. Cl. 310—313 B **3 Claims**



1. A group-arranged type surface acoustic wave transducer including plural groups of two interdigital electrodes having an equal number of electrode finger pairs, connected 90° out of phase with each other, and disposed in such a manner that the center-to-center distance therebetween is equal to an odd number of quarter wavelengths, wherein:

the center-to-center distance between the interdigital electrodes in part of said plural groups is made to be equal to an integer number of wavelengths plus a quarter wavelength, and the center-to-center distance between the interdigital electrodes in the remaining groups is made to be equal to an integer number of wavelengths plus three quarter wavelengths.

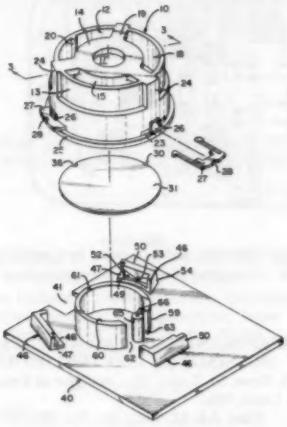
4,429,247

PIEZOELECTRIC TRANSDUCER SUPPORTING AND CONTACTING MEANS

Steven Feldman, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 28, 1982, Ser. No. 343,680
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—322 **18 Claims**

1. Supporting and contacting means for a piezoelectric audio transducer, said transducer being in the form of a circular metal wafer having a first all metal surface and an opposed second surface having a piezoelectric ceramic bonded thereto, said supporting and contacting means being of the type comprising a housing having an annular surface therein, said annular surface contacting said first surface of said transducer, said supporting and contacting means further comprising first and second electrical contacts in contact with said second surface



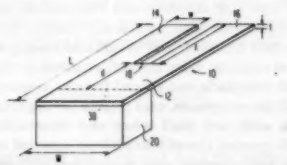
thereof, said supporting and contacting means being characterized in that said contacts are essentially point contacts and said transducer is supported by being clamped between said annular surface and said two electrical contacts, said electrical contacts providing the sole support for said second surface of said transducer, said housing being profiled to closely receive said transducer so that the annular surface is concentric relative to the outer edge of the transducer.

4,429,248

MOUNTING APPARATUS AND METHOD FOR PIEZOELECTRIC TUNING FORK

Shih Chuang, Irvine, Calif., assignor to Statek Corporation, Irvine, Calif.

Filed May 27, 1981, Ser. No. 267,815
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—370 **4 Claims**



1. A microresonator, comprising:

a pedestal having a forward edge and at least one support surface;

a flexural mode tuning fork having a stem with a forward means portion and a rearward portion, said forward means portion having a length d for suppressing overtone components when said tuning fork is operated at its fundamental frequency, a pair of tines extending forward from said forward means portion of said stem, a slot between said tines and a crotch at the base of said slot where said tines join said forward means portion of said stem, said rearward portion of said stem being positioned on said support

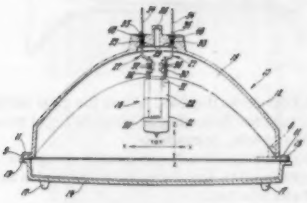
surface of said pedestal to support said tuning fork and said length d of said forward means portion beginning at said forward edge of said pedestal and extending to said crotch.

4,429,249

SEALED BEAM LAMP AND METHOD OF MANUFACTURE

David O. Tyler, Anderson, and George M. Gasparovic, Pendleton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 128,674, Mar. 10, 1980, abandoned.
This application Mar. 29, 1982, Ser. No. 362,759
Int. Cl.³ H01J *5/16, 61/40*; H01K *1/26, 1/30*
U.S. Cl. 313—113 **5 Claims**



1. A sealed beam lamp consisting of at least two lamp terminals each of which has a blade portion provided with an inner end and an outer end, a lens, light bulb and reflector, said lens being positioned on and sealed to the front of a flange formed on the open front end of said reflector to form a sealed envelope containing the light source, said light bulb being supported by and having lead wires which are electrically connected to said inner ends of said blade portions of said terminals and positioned within said envelope and constituting a light source assembly, said terminals extending through terminal openings formed at the rear of said reflector so as to locate said outer ends exteriorly of said envelope for interconnection with a power source, means formed on at least one of said terminals for preventing said light source assembly from falling into said envelope, said terminal openings being large enough to allow adjustment of said light source assembly with respect to said reflector in the X-Y-Z axes to obtain optimum location of said light source assembly with respect to said reflector, said light source assembly being secured in said reflector by adhesive made of an insulating material contained in a recessed portion surrounding each of said terminals, said sealed beam lamp further including aiming pads on said lens face to enable the establishment of an aiming plane, and means provided on the outer surface of said reflector to enable seating of said sealed beam lamp in a vehicle in an oriented position, the aim of said sealed beam lamp being achieved at the same time said light source assembly is positioned with respect to said reflector.

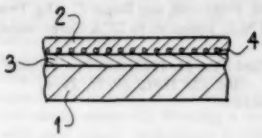
4,429,250

DIRECT HEATING CATHODE FOR HIGH FREQUENCY THERMIONIC TUBE

Guy Clerc, and Arvind Shroff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 105,506, Dec. 20, 1979, abandoned.
This application Sep. 18, 1981, Ser. No. 303,464
Claims priority, application France, Dec. 27, 1978, 78 36487
Int. Cl.³ H01J *1/16*
U.S. Cl. 313—336 **9 Claims**

1. A direct heating cathode for a radio frequency electron tube, comprising a hollow cylinder pyrolytic graphite supports; a lanthanum hexaboride-based thermoemissive material layer; and an intermediate layer separating said support and said thermoemissive material, said intermediate layer comprising a diboride of a metal selected from the group titanium, zirconium, hafnium, niobium and tantalum and forming a diffusion barrier for the atoms forming said support and said thermoemissive material layer, and is made of a material which does not react chemically with carbon or boron.

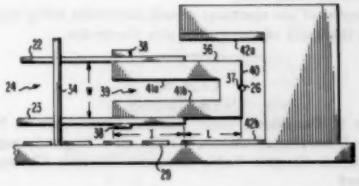


4,429,251

LINE CATHODE SUPPORT STRUCTURE FOR A FLAT PANEL DISPLAY DEVICE

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 5, 1982, Ser. No. 355,253
Int. Cl.³ H01J *29/50, 29/70*
U.S. Cl. 313—411 **8 Claims**



1. In a flat panel display device having an envelope including a baseplate, a front plate, sidewalls and a plurality of internal support walls dividing said envelope into a plurality of channels, each of said channels including a plurality of guide meshes arranged in a spaced parallel relationship to form a space between said meshes, said display device also having a line cathode arranged perpendicular to said channels for emitting electrons for propagation in said spaces, an improved cathode support structure for supporting said cathode equidistant from and in alignment with said spaces for all of said channels comprising:

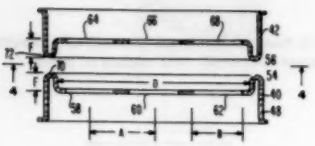
a substantially U-shaped support including a closed end and two arms transversely dimensioned to span said space whereby said U-shaped support fits transversely across said space and said arms are spring biased against said meshes, said U-shaped support having high thermal conductivity and being electrically insulatively, said U-shaped support including an indention arranged in the closed end for supporting said cathode in alignment with said space and being longitudinally dimensioned to support said cathode a predetermined distance from said space;

said arms including retaining means for retaining said support between said guide meshes, and said guide meshes including additional retaining means arranged at a selected position from the input of said guide meshes for mating with said retaining means whereby said notch is positioned said predetermined distance from said space.

4,429,252
COLOR PICTURE TUBE HAVING AN EXPANDED FOCUS LENS TYPE INLINE ELECTRON GUN WITH IMPROVED STATIC CONVERGENCE

Leon J. Vieland, Princeton, and Roger C. Alig, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 348,023
Int. Cl.³ H01J 29/51, 29/46
U.S. Cl. 313—414 3 Claims



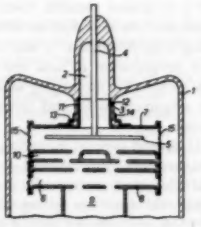
1. In a color picture tube having an inline electron gun for generating and directing a plurality of electron beams along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the main focus lens being formed by two spaced electrodes, each electrode including a portion having a plurality of apertures therein equal to the number of electron beams, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, the apertured portion of each electrode being within a recess set back from the rim, the improvement comprising

the depths of the apertures in said electrodes being equal to the thickness of material of said electrodes.

4,429,253
THYRATRONS

Timothy P. Donaldson, Great Totham; Christopher V. Neale, Peverel, and Hugh Menown, Writtle, all of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed May 8, 1981, Ser. No. 261,809
Claims priority, application United Kingdom, May 10, 1980, 8015571; Nov. 14, 1980, 8036631
Int. Cl.³ H01J 17/04
U.S. Cl. 313—573 8 Claims

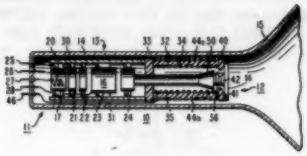


1. A glass enveloped thyratron having an anode carried by an anode pin extending through a glass neck in the thyratron envelope and forming a tubular pant leg, said anode being surrounded by a screening box having a back plate with a tubular portion extending away from said anode into the interior of said pant leg to surround said anode pin, said tubular portion being exposed to said anode pin without the intermediary of glass material, and wherein a mounting collar secured to the rear of said back plate is provided to surround and engage with the outer surface of the extremity of said pant leg adjacent said back plate, and said pant leg is flared outwardly, at said extremity, into engagement with said mounting collar.

4,429,254
DEFLECTION YOKE INTEGRATED WITHIN A CATHODE RAY TUBE

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,632
Int. Cl.³ H01J 23/16, 29/96
U.S. Cl. 315—3 10 Claims



1. A deflection yoke disposed within the glass envelope of a cathode ray tube for deflecting an electron beam produced by said cathode ray tube, comprising:

a plurality of magnetically permeable elongated members incorporating flux directing means disposed in the vicinity of said electron beam;

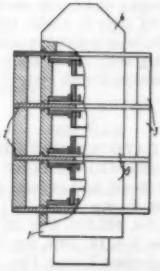
electron beam deflction coils wound on said elongated members adapted to be energized for producing electromagnetic fields in the vicinity of said coils and in the vicinity of said flux directing means for deflecting said electron beam; and

shielding means interacting with said electromagnetic fields for shielding said electron beam from said electromagnetic fields outside the region occupied by said flux directing means.

4,429,255
KLYSTRON

Vitaly I. Pasmannik, ulitsa Ostrovityanova, 45, korpus 1, kv. 569; Ljudmila A. Mironenko, prospekt Vernadskogo, 67, kv. 45, and Sergei N. Nazarov, ulitsa Dneprope trovskaya, 23, korpus 3, kv. 47, all of Moscow, U.S.S.R.

PCT No. PCT/SU79/00121, § 371 Date Jun. 1, 1981, § 102(e) Date Jun. 1, 1981, PCT Pub. No. WO81/01628, PCT Pub. Date Jun. 11, 1981
PCT Filed Nov. 28, 1979, Ser. No. 270,515
Int. Cl.³ H01J 25/10
U.S. Cl. 315—5.39 2 Claims



1. A klystron comprising cavities with face walls in which drift tubes are accommodated in a coaxial relation to the bodies of the cavities characterized in that there are annular slots (9) in the face walls (7) and in the drift tubes (8), said annular slots accommodating plates (10) rigidly attached thereto, the height

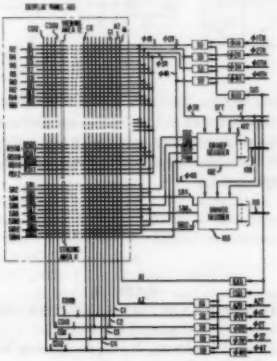
of the plates (10) being less than half the height of the body (6) of the cavity (5), the length of the plates (10) being the half-difference between the inner diameter of the cavity (6) and the inner diameter of the drift tube (8), and the length of the inner circumference of the body (6) being more than ten times the total thickness of the plates (10).

4,429,256

SELECTIVE SHIFTING AC PLASMA PANEL

Peter D. T. Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 30, 1981, Ser. No. 307,169
Int. Cl.³ H05B *41/14*
U.S. Cl. 315—169.4 **16 Claims**



1. Circuitry for use in an ac plasma panel display system, said circuitry comprising

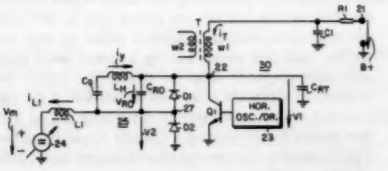
first means for inhibiting charge cloud transportation at selected ON sites within said panel while still allowing said transportation between other of said sites, said first means including means for prematurely activating said charge cloud at said selected ON sites.

4,429,257

VARIABLE HORIZONTAL DEFLECTION CIRCUIT CAPABLE OF PROVIDING EAST-WEST PINCUSHION CORRECTION

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 428,238
Claims priority, application United Kingdom, Apr. 23, 1982, 8211833
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—371 **16 Claims**



1. A power supply and modulated deflection circuit, comprising:

a deflection winding;

switching means coupled to said deflection winding and operated at a deflection rate to generate scanning current in said deflection winding during a trace interval of a deflection cycle;

a deflection retrace capacitance for forming a deflection retrace resonant circuit with said deflection winding to produce a retrace pulse voltage during a retrace interval of said deflection cycle;

a source of supply energy;

a supply inductance coupled to said source;

a second capacitance coupled to said supply inductance and to said switching means for forming a second resonant circuit with said supply inductance within said retrace interval to generate a pulse voltage;

a load circuit energized by said pulse voltage;

an impedance interposed during said retrace interval in a current path between said deflection retrace and second resonant circuits to isolate said deflection retrace resonant circuit from modulation of said retrace pulse voltage by loading variations on the pulse voltage generated by said second resonant circuit; and

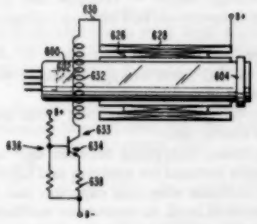
a source of modulation current coupled to said impedance for producing modulation of said scanning current as said modulation current varies.

4,429,258

ELECTRON BEAM ALIGNMENT IN TUBE/COIL ASSEMBLIES

Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 10, 1981, Ser. No. 253,013
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—382 **1 Claim**



1. An improved portable television camera arrangement adapted to be powered from a battery, comprising:

a camera tube including an electron gun assembly for emitting a beam of electrons directed along a path towards a photosensitive target, said beam as it leaves said electron gun assembly being unfocussed and directed at an arbitrary angle relative to a path orthogonal to the plane of said target, thereby causing image distortion;

a focus coil arranged about said path and having its axis coaxial with that of said camera tube and energized by a substantially constant focus current for causing said beam of electrons to be focused at said target;

and a beam alignment winding assembly arranged about said path and energized for magnetically influencing the path taken by said beam for causing said path to orthogonally intersect the plane of said target;

wherein the improvement lies in that said beam alignment winding assembly has a single magnetic axis which is physically oriented radially and electrically coupled with said focus coil in such a manner that said substantially constant focus current flows through said beam alignment winding assembly for energization thereof thereby eliminating the need for a separate beam alignment winding current source and also eliminating the need for a second magnetic axis associated with said beam alignment winding assembly.

4,429,259

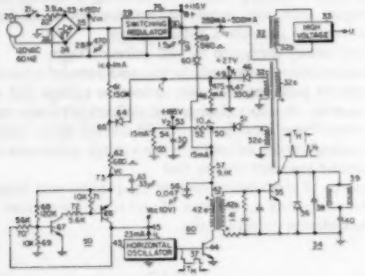
HORIZONTAL DEFLECTION CIRCUIT WITH A START-UP POWER SUPPLY

David W. Luz, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 186,789, Sep. 12, 1980. This application Jun. 22, 1981, Ser. No. 276,305

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—408 **12 Claims**



1. An oscillator-derived power supply with start-up circuitry, comprising:

a supply terminal;

an oscillator being energized by the voltage developed at said supply terminal for producing an oscillator output signal;

a start-up voltage supply to energize said oscillator into commencing operation, said start-up voltage supply comprising:

a capacitor,

a source of DC input voltage available prior to commencement of oscillator operation,

means for charging said capacitor from said DC input voltage source, and

switching means interposed between said capacitor and said supply terminal for applying said capacitor voltage to said oscillator after said capacitor has charged to a first threshold level, to commence oscillator operation;

means responsive to said oscillator output signal for developing a steady-state voltage; and

means for applying said steady-state voltage to said supply terminal via said switching means to maintain oscillator energization during steady-state operation.

4,429,260

TELEVISION RECEIVER POWER SUPPLY FERRORESONANT LOAD CIRCUIT PROVIDED WITH A REDUNDANT OPERATING CAPABILITY

Walter Truskalo, Titusville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 8, 1981, Ser. No. 309,642

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **12 Claims**

1. A self-regulating power supply for a television display system, comprising:

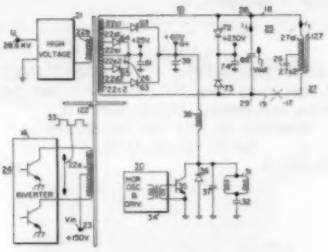
a source of input voltage;

a transformer including primary and secondary windings, said primary winding being coupled to said source for developing an alternating polarity supply voltage across said secondary winding;

means including a high voltage rectifier arrangement responsive to the alternating polarity voltage developed across said secondary winding for developing an ultor accelerating potential for a picture tube of said television display system; and

a self-regulating load circuit including a saturable reactor having a winding coupled to said transformer secondary winding for regulating said supply voltage,

said transformer secondary winding and said saturable reactor winding each comprising two winding sections, each



winding section having a terminal coupled to a common reference point so as to avoid an excessive increase in said supply voltage when a portion of said self-regulating load circuit becomes disconnected from said transformer secondary winding.

4,429,261

APPARATUS FOR CONTROLLING THE TENSION OF A CASSETTE TAPE

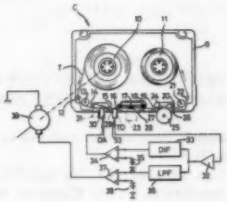
Hirotoshi Ohno, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 4, 1981, Ser. No. 327,673

Claims priority, application Japan, Dec. 6, 1980, 55-172498; Jan. 19, 1981, 56-6175

Int. Cl.³ B65H *59/38*

U.S. Cl. 318—6 **10 Claims**



1. Apparatus for controlling the tension of tape in a tape recorder cassette, comprising:

(a) first means for producing an output signal indicative of the vibration in and tension of the tape in the vicinity of the record/reproduce magnetic head of said tape recorder, said first means having a sensor head positioned near said magnetic head to enable the sensor head to respond to vibration in as well as tension of the tape;

(b) second means responsive to the output signal from said first means for producing a control signal by detecting a high frequency component of said output signal indicative of tape vibration;

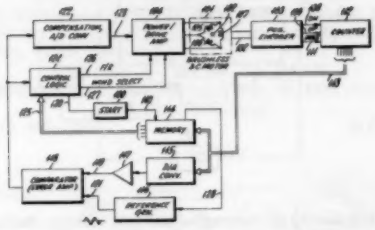
(c) third means for damping vibrations of said tape in the vicinity of said first means in accordance with said control signal, said third means having a member which is contactable with said tape, said member being movable in accordance with said detected high frequency component.

4,429,262

THREE PHASE MOTOR OSCILLATORY SERVO CONTROL

Michael R. Utenick, Englewood, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Sep. 12, 1980, Ser. No. 186,928
Int. Cl.³ H02K *29/00, 29/02*
U.S. Cl. 318—254 **4 Claims**



1. Apparatus for maintaining a substantially constant speed oscillatory motion of an element comprising:

(a) a brushless DC torque motor for moving said element including amplifier drive means for selectively providing motive power to respective windings of said motor;

(b) encoder means for developing a signal representative of the actual position of said element;

(c) first feedback control loop means including

(i) a source of positional reference signals representative of constant speed oscillatory motion;

(ii) comparator means for evaluating the difference between said actual position signal and said positional reference signal, and

(iii) means, responsive to said comparator means for providing speed correctional signals to said amplifier drive means; and

(d) second feedback control loop means including

(i) digital memory means, for maintaining a stored representation of the speed-torque-position characteristic of said motor,

(ii) said memory means including means responsive to said actual position signal for providing torque and phase correctional signals to said drive amplifier means;

(e) whereby said amplifier drive means operates to reduce said evaluated difference at relatively peak motor torque for said actual position.

4,429,263

LOW MAGNETIC LEAKAGE FLUX BRUSHLESS PULSE CONTROLLED D-C MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 60,879, Jul. 26, 1979, abandoned. This application Dec. 23, 1980, Ser. No. 220,181
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835210
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 **29 Claims**

1. Brushless d-c cylindrical air gap motor system having

a permanent magnet rotor (**13, 14**) having at least four poles;

a stator (**22**);

two-filament winding means (**40, 41**) on said stator;

a plurality of core elements (**21**) for said winding means and having part-circumferentially extending stator pole shoes (**23**) leaving gaps (**24**) between the ends of adjacent pole shoes,

means including a controllable current source (**48, 49, 47, 54**) for supplying said winding means with only two current pulses for each revolution of 360°-electrical of the rotor,

a galvano-magnetic sensor (**16**) located close to two of said stator core elements, responsive to the magnetic field from the rotor and providing output information representative of the position of the rotor, and connected to control said controllable current source to energize

a filament of the respective winding means,

wherein

each filament (**40, 41**) of the winding means (**45; 74, 75; 78, 79**) associated with respective stator poles is so wound on the stator core elements and so energized that

each North pole carrying an energized stator winding means

corresponds to a South pole carrying an energized stator winding means and forms a pole pair therewith,

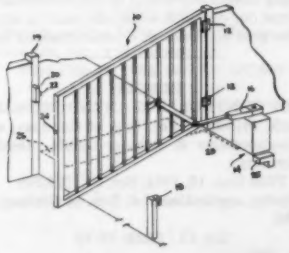
each pole of such a North pole-South pole pair produces a substantially equal absolute value of magnetic flux at the air gap, and each pole of such a North pole-South pole pair is substantially equidistant with respect to said galvano-magnetic sensor (**16**), to obtain substantial cancellation and elimination of undesired leakage fluxes from the energized stator poles acting on the galvano-magnetic sensor.

4,429,264

SYSTEM AND METHOD FOR THE AUTOMATIC CONTROL OF ELECTRICALLY OPERATED GATES

Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 125,717, Mar. 3, 1980. This application May 22, 1981, Ser. No. 266,182
Int. Cl.³ H02P *3/00*
U.S. Cl. 318—466 **39 Claims**



1. A system for the automatic control of an electrically operated gate, comprising:

drive means operatively coupled to the gate for moving it between the open and closed positions;

means for determining the amount of movement of the gate as it moves between the open and closed positions;

storage means for storing the initial amount of movement of the gate as it moves between the full open and the full closed positions;

comparison means for comparing the subsequent amount of movement of the gate to the stored initial amount of movement; and

control means for controlling the drive means in response to the comparison means.

4,429,265

MOTOR DRIVEN WINDOW WINDING MECHANISMS

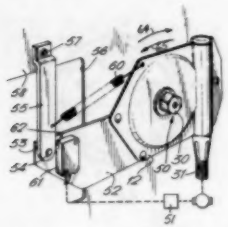
Dominic P. E. Barnard, Witney, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Dec. 15, 1980, Ser. No. 216,707

Claims priority, application United Kingdom, Dec. 14, 1979, 7943141; Jul. 24, 1980, 8024347

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—475 **32 Claims**



1. A motor driven winding mechanism for driving a raising and lowering mechanism of a structural element such as a window or the like, said raising and lowering mechanism being mounted in a vehicle panel or the like and having an operating shaft mounted on said panel, rotation of said shaft being effective to move said structural element, said winding mechanism comprising:

a motor;

a reduction gear unit adapted to be mounted on and supported by said operating shaft, said gear unit comprising a casing, an input gear supported by said casing and arranged to be driven by said motor and an output gear supported by said casing and arranged to be operatively coupled to said operating shaft for rotating said operating shaft; and

means for sensing the reactive torque produced in said reduction gear unit as a function of rotation of said casing and said input gear about said operating shaft as said winding mechanism encounters resistance to movement of said structural element in at least one direction and for preventing further movement of said structural element in said at least one direction when said reactive torque in said reduction gear unit exceeds a predetermined value.

4,429,266

METHOD OF CONTROLLING AN INDUSTRIAL ROBOT

Hans R. Tradt, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,510

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046634

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—568 **5 Claims**

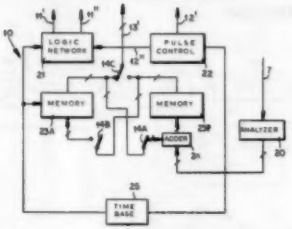
1. A method of programming an industrial robot for machining a workpiece with the aid of a tool carried on a free extremity of a mobile robot arm, comprising th steps of:

(a) providing a pattern with a surface conforming to the desired shape of the workpiece;

(b) fitting the extremity of the robot arm with a sensor in the position of the machining tool;

(c) loading a first memory with data giving the locations of a multiplicity of closely juxtaposed but discrete skeletal points on the surface of said pattern and with instructions for the guidance of said extremity along intervening lines of uniform character roughly paralleling the paths linking said points on the pattern surface;

(d) tracing said pattern with a tip of said sensor under the control of the contents of said first memory by successively displacing said extremity across all said skeletal points with yieldable entrainment of said sensor by said extremity enabling limited movements of said tip relative to said robot arm in response to deviations of said paths from said intervening lines between adjacent skeletal points; and



(e) transferring the contents of said first memory, during the tracing of the pattern in step (d) to a second memory while modifying, on the basis of the deviations represented by the relative movements of said tip, the instructions accompanying said data to establish a definite program for the guidance of a tool replacing said sensor on said extremity.

4,429,267

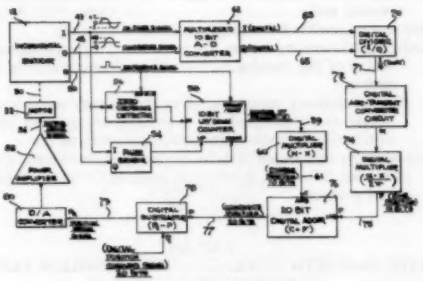
DIGITAL POSITIONING SYSTEMS HAVING HIGH ACCURACY

John R. Veale, Manhattan Beach, Calif., assignor to Manhattan Engineering Company, Inc., Manhattan Beach, Calif.

Filed Jun. 22, 1981, Ser. No. 275,926

Int. Cl.³ G05B *11/18*

U.S. Cl. 318—594 **18 Claims**



1. A digital positioning system for precisely controlling the position of a dynamically moveable member, comprising:

position sensor means for sensing an incremental position of the member, and for providing first and second sensor signals in the form of first and second periodic trigonometric functions, respectively, each representative of the incremental position of the member within a fixed interval of distance, and providing a third sensor signal representative of a reference position of the member;

means responsive to the three sensor signals for providing a coarse position signal including means for counting the number of cycles of the first sensor signal;

means responsive to the first and second sensor signals for providing a fine position signal including means for combining the first and second sensor signals to form a third trigonometric function, and means for converting the third trigonometric function to an angle representative of the incremental position of the member within the fixed interval of distance;

means for combining the coarse and fine digital position signals to form a composite position signal representing the absolute position of the member; and

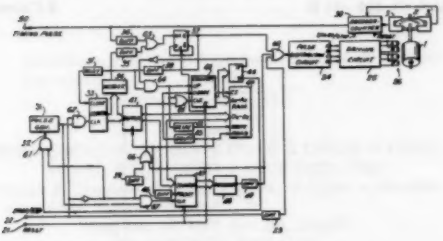
means for providing a corrective signal to correct the position of the member based on the composite digital position signal.

4,429,268

SPEED CONTROL FOR STEP MOTORS

Torao Yajima, and Yoshifumi Gomi, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha & Epson Corporation, Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 244,936
Claims priority, application Japan, Mar. 19, 1980, 55-34930
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—696 **28 Claims**



1. A speed control for step motors comprising detector means for producing timing signals representative of the incremental advance of the step motor; motor driving means for actuating the step motor in response to the actuation of said motor driving means for advancing said step motor; and speed control circuit means periodically actuating said motor driving means at least in part in response to said timing signals during acceleration of said step motor, said speed control circuit means including memory means for storing the time interval between respective actuations of said motor driving means during acceleration of said step motor, said speed control circuit means being adapted to actuate said motor driving means during deceleration of said step motor at intervals which are a function of the stored acceleration intervals in said memory means applied in reverse order.

4,429,269

FEED FORWARD AC VOLTAGE REGULATOR EMPLOYING STEP-UP, STEP-DOWN TRANSFORMER AND ANALOG AND DIGITAL CONTROL CIRCUITRY

Johnny F. Brown, Santa Clara, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 12, 1982, Ser. No. 367,646
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—301 **12 Claims**

1. A feed forward electronic regulator for regulating voltage on an AC line, comprising:

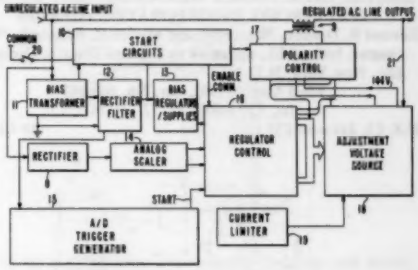
a step-up, step-down transformer having one winding placed in said AC line inbetween the unregulated and regulated portions of said line;

analog circuitry electrically connected to said unregulated portion of said AC line, said analog circuitry including circuit means for generating an internal reference voltage representing the desired voltage level for said AC line, said analog circuitry further including circuit means for comparing the voltage level sensed in said unregulated portion of said AC line with said internal reference voltage and for generating an error signal which represents the discrepancy between said internal reference voltage and said voltage sensed in said unregulated portion of said AC line;

digital control circuitry electrically connected to said analog circuitry for receiving said analog error signal and in response thereto generating a digital instruction which corresponds to a particular incremental correction voltage required to adjust said voltage of said AC line to said desired voltage level;

a segmented transformer having multiple taps configured thereon, one winding of said segmented transformer being electrically connected to said regulated portion of said AC line;

an array of solid state switches, each of said switches being



connected between a particular one of said taps on said segmented transformer and said digital control circuitry, said switches being selectively actuated by said digital instruction to make available a particular incremental correction voltage from said segmented transformer; and

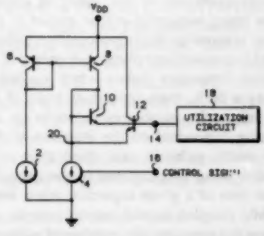
polarity control circuitry electrically connected between said array of solid state switches and the other winding of said step-up, step-down transformer to receive said particular incremental correction voltage from said array and apply it to said other winding with the requisite polarity to obtain regulation.

4,429,270

SWITCHED CURRENT SOURCE FOR SOURCING CURRENT TO AND SINKING CURRENT FROM AN OUTPUT NODE

Robert B. Davies, and Ira Miller, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,905
Int. Cl.³ G05F *3/08*
U.S. Cl. 323—317 **5 Claims**



1. A switched current source for sourcing current to and sinking current from an output node connectable to a utilization circuit, comprising:

first current source means for producing a first current;

a gated current source for producing a second current when said gated current source is switched on, said second current being greater than said first current;

diode means having an anode coupled at a junction point

between said first current source means and said gated current source and having a cathode coupled to said node, said diode means for supplying said first current to said output node when said gated current source is off; and

a first transistor having a collector connectable to a source of supply voltage, an emitter coupled to said junction, and a base coupled to said cathode and to said output node, said first transistor sinking a third current from said output node when said gated current source is on.

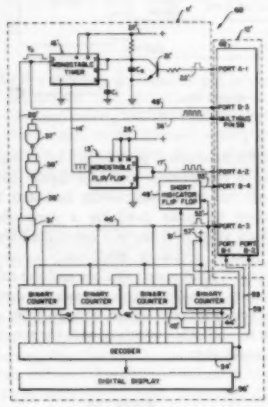
4,429,271
DIGITAL CAPACITANCE MEASURING TEST SET AND TEST CIRCUIT INCORPORATED THEREIN

Edward R. Doubek, Naperville, and Marlon Z. Kasprzyk, Westchester, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 4, 1981, Ser. No. 260,443

Int. Cl.³ G01R *11/52, 27/26*

U.S. Cl. 324—60 CD **18 Claims**



1. A capacitance measuring test set comprising:

first means responsive to a first train of pulses when applied thereto for generating a second train of narrow width output trigger pulses;

second means responsive to each of said trigger pulses, and to the capacitance of a capacitor when coupled thereto and charged relative to ground, for generating a third train of output pulses, the width of each of which pulses is directly proportional to the value of capacitance of a capacitor being measured at that instant in time;

third means, responsive to each successive pulse of said third train, and to a coincident number of pulses of a fourth train of constant frequency pulses when applied thereto, for producing a fifth, time-dependent train of constant frequency pulses, the number of pulses in each of said fifth trains being dependent on the duration of the associated variable width pulse in said third train of pulses and, hence, also being proportional to the capacitance at that instant in time of a given capacitor when under measurement while coupled to said second means;

fourth means for counting the number of pulses appearing in each fifth train of pulses, and for transforming that number into a digitized readout correlated with a time-coincident value of capacitance then exhibited by a capacitor while under measurement;

fifth high speed switch means adapted to shunt a capacitor when connected to said second means, and being responsive to a given RESTORE pulse whenever applied thereto for effecting the shorting of each capacitor to ground, after having been previously charged to a predetermined voltage, at the completion of an associated capacitance measuring period;

sixth means for sensing for the completion of each capacitance measurement period, and for controlling the start of the next measurement period, and

multi-pulse train generating means for supplying said first and fourth pulse trains and said RESTORE pulses.

4,429,272
APPARATUS FOR INDICATING DIELECTRIC CONSTANT

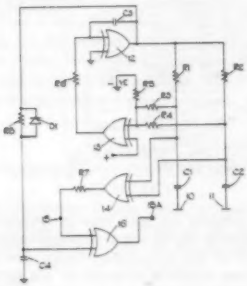
Michael R. Bungay, Sudbury, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 5, 1981, Ser. No. 318,433

Claims priority, application United Kingdom, Feb. 18, 1981, 8105149

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **9 Claims**



1. Apparatus for providing an indication of a change in the dielectric constant of a fluid comprising a pair of electrodes, at least one of which in use is surrounded by said fluid, an oscillator operable to charge and discharge capacitors formed by said electrodes, said oscillator including a pair of exclusive OR circuits, a first pair of resistors connecting the output of one of said exclusive OR circuits to said capacitors respectively, a second pair of resistors connecting the capacitors respectively to one input of the other exclusive OR circuit, the output of said other exclusive OR circuit being connected in use to one input of said one exclusive OR circuit, the other inputs of the exclusive OR circuits being connected to opposite polarity supply lines respectively, the frequency of oscillation of said oscillator being dependent upon the rate of change of voltage across either one of said capacitors during a cycle, and means responsive to the difference in the voltages developed across said capacitors, said means providing an indication of a change in the dielectric constant of the fluid.

4,429,273
OIL-WATER MONITOR

Roy P. Mazzagatti, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,863

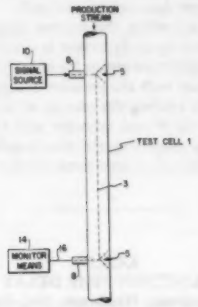
Int. Cl.³ G01R *27/04, 27/26*

U.S. Cl. 324—61 R **7 Claims**

1. An oil-water monitor which monitors a production stream comprising

cell means for having the production stream pass through it in such a manner that the dielectric properties of the production stream may be monitored, regardless of whether the production stream is in a water-in-oil condition, an oil-in-water condition or a combination of the two conditions, and

means connected to said cell means for providing an indication of the water content of the production stream in



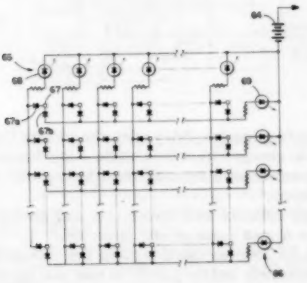
accordance with the dielectric properties of the production stream.

4,429,274

WIRE LOCATOR DEVICE HAVING A DIODE MATRIX BOARD WITH LIGHT PAIR INDICATORS

Thomas R. Hamblen, Indianapolis, Ind., assignor to Hamblen Gage Corp., Indianapolis, Ind.

Filed Jun. 19, 1980, Ser. No. 160,979
Int. Cl.³ G01R *19/00, 31/02*
U.S. Cl. 324—66 **13 Claims**



1. A portable wire locator device for sequential identification of conductors within a detached, multi-conductor cable, said wire locator device comprising;

a matrix board having a plurality of wire-receiving terminals arranged into rows and columns;

a first, linear series of lights arranged adjacent one edge of said matrix board and in line with said wire-receiving terminals;

a second, linear series of lights arranged adjacent another edge of said matrix board and in line with said wire-receiving terminals, said first and second linear series being substantially perpendicular to each other, said first and second linear series being connected in light pairs wherein one light of each pair is from said first linear series of lights, and wherein the other light of each pair is from the second linear series of lights, a common connection of each light pair being operatively and electrically connected to a different one of said plurality of wire-receiving terminals; and

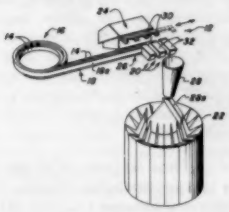
a direct-current source of electrical power, one side of which is coupled to each light in said first and second linear series, a particular light pair being illuminated by electrical coupling of the corresponding wire-receiving terminal to the opposite side of said source of electrical power.

4,429,275

HANDLING AND TEST APPARATUS FOR RADIAL LEAD ELECTRONIC DEVICES

Nicholas J. Cedrone, 10 Hawthorne Rd., Wellesley Hills, Mass. 02181

Filed Jul. 30, 1980, Ser. No. 173,445
Int. Cl.³ G01R *31/00;* **B07C** *5/344*
U.S. Cl. 324—158 F **34 Claims**



1. In an apparatus for automatically handling and testing radial lead electronic devices, said apparatus including a housing, a drive shaft mounted on said housing for rotational motion, and at least one contactor assembly including a set of contacts adapted to establish electrical connection with the leads of said devices when they are held stationary at a test station with their leads extending generally in a first direction, the improvement comprising, a probe assembly supported on said housing that includes

a platform that mounts said contactor assembly,

means powered by said rotating drive shaft for driving said platform in a closed loop cycle of motion, said cycle of motion including components of motion in said first direction and in a second direction perpendicular to said first direction, a portion of said cycle of motion placing said contacts in an engaging relationship with said leads and drawing said contacts along said leads in a wiping movement, and

means for replaceably connecting said drive shaft to said drive means,

said probe assembly comprising an integral, self-contained unit.

4,429,276

MAGNETORESISTIVE DISPLACEMENT SENSOR AND SIGNAL REPROCESSING CIRCUITS THEREFOR

Akihisa Narimatsu, Naka, and Hiroyuki Ohkubo, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 88,811, Oct. 29, 1979, abandoned. This application Apr. 15, 1982, Ser. No. 368,504
Claims priority, application Japan, Oct. 27, 1978, 53-132810
Int. Cl.³ G01B *7/14;* **H01L** *43/00*
U.S. Cl. 324—207 **15 Claims**

1. A magnetoresitive displacement sensor for use with at least one elongated magnetic grating having a wavelength, comprising:

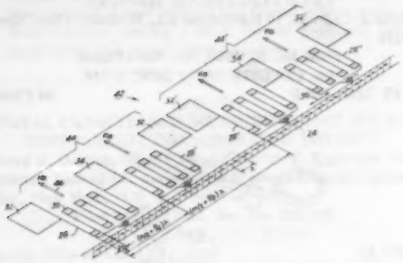
a first magnetoresistive sensor operative to produce a first output signal in response to displacement thereof with respect to said at least one magnetic grating;

a second magnetoresistive sensor operative to produce a second output signal in response to the displacement thereof with respect to said at least one magnetic grating;

each of said first and second magnetoresistive sensors having parallel stripes of magnetoresistive material disposed in serpentine configuration with two adjacent stripes spaced apart from each other by a predetermined integral multiple of one-half said wavelength;

said first and second magnetoresistive sensors being fixed relative to each other and having a relative spacing therebetween substantially equal to a predetermined fraction of said wavelength;

a bias magnetic field applied to said first and second magnetoresistive sensors; and



the combination of said bias magnetic field and said relative spacing between said sensors being effective to produce a relative phase difference between said first and second output signals of substantially less than 180 degrees.

4,429,277

NUCLEAR MAGNETIC RESONANCE APPARATUS UTILIZING MULTIPLE MAGNETIC FIELDS

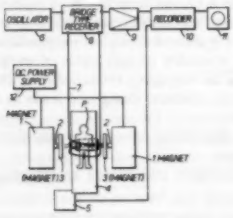
Hiroshi Sugimoto, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 20, 1981, Ser. No. 265,643

Claims priority, application Japan, Jun. 13, 1980, 55-79788

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **9 Claims**



1. A nuclear magnetic resonance apparatus for registering the nuclear magnetic resonance condition of atomic nuclei distributed in a body, the apparatus comprising:

first magnetic field generating means for generating a homogeneous static magnetic field said generating means including magnetic means for focusing the homogeneous static magnetic field into a thin beam shape for application to a selected portion of the body, said magnetic focusing means including a pair of electromagnets and a D.C. stabilized power supply for driving a pair of electromagnets;

second magnetic field generating means for simultaneously generating a gradient magnetic field of smaller intensity than that of the beam-shaped static magnetic field and of such distribution as to gradually increase or decrease in the direction of said beam-shaped static magnetic field;

an oscillator for generating electromagnetic waves having a frequency corresponding to the nuclear magnetic resonance condition of the atomic nuclei to be measured;

a coil wound around the body to be examined, at least a portion of said coil lying in said magnetic fields, impressing said electromagnetic waves upon said body and detecting the nuclear magnetic resonance in said body;

drive means for moving said body in a direction perpendicular to the beam-shaped magnetic field;

a receiver for receiving and processing the nuclear magnetic resonance signal detected by said coil;

a recorder for recording the nuclear magnetic resonance signal processed by said receiver in synchronism with the operation of said drive means for identifying the recorded resonance signal with the position of said body; and

a display unit for reading the records as to a desired region of the body out of said recorder and for selectively or simultaneously displaying the distribution and relaxation time of the relevant atomic nuclei in said body.

4,429,278

MULTI-FUNCTION TIME DELAY RELAY

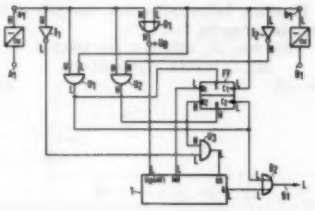
Hans-Wolfgang Steinlein, Hersbruck, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,637

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034734

Int. Cl.³ H03K *17/28, 17/296*

U.S. Cl. 328—129.1 **4 Claims**



1. A multi-function time delay relay, the selected function of which can be changed from the outside, comprising:

(a) an electronic programmable timer having start, stop and reset inputs;

(b) a logic network with two inputs and having outputs coupled to said inputs of said timer; and

(c) means for coupling one side of the line voltage individually, separately and/or jointly to said two inputs at any point in time to select different modes of operation of the programmable timer.

4,429,279

VARIABLE BANDWIDTH FILTER

Keith H. Wycoff, 1205 N. Tyler St., Lexington, Nebr. 68850, and William H. Dittmer, Mesa, Ariz., assignors to Keith H. Wycoff, Lexington, Nebr.

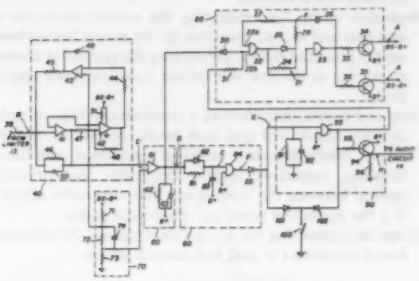
Division of Ser. No. 165,212, Jul. 1, 1980, which is a continuation-in-part of Ser. No. 84,460, Oct. 12, 1979, abandoned. This application Jun. 14, 1982, Ser. No. 388,115

Int. Cl.³ H04B *1/10*

U.S. Cl. 328—139 **7 Claims**

1. A signal detector for a signal receiver having means for supplying AC signals, said detector comprising a frequency sensor having an output and first and second inputs, said first input being coupled to the AC signal supplying means, said frequency sensor being operative to produce an output signal on said output in response to an AC signal having a frequency within a variable bandwidth, and a source of initializing voltages independent of the AC signal supplying means and cou-

pled to said second input, said frequency sensor being responsive to the initializing voltages to cause the bandwidth to be



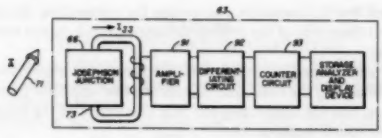
relatively wide upon application of each initializing voltage and to decrease thereafter.

4,429,280

APPARATUS AND METHOD FOR DEMODULATION OF A MODULATED CURL-FREE MAGNETIC VECTOR POTENTIAL FIELD

Raymond C. Gelinas, Concord, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 198,325
Int. Cl.³ H03D *1/00*
U.S. Cl. 329—200 **6 Claims**



1. Apparatus for demodulating a modulated curl-free magnetic vector potential field comprising:

means for detecting said curl-free magnetic vector potential field, said detecting means having an observable property determined by a magnitude of said curl-free magnetic vector potential field; and

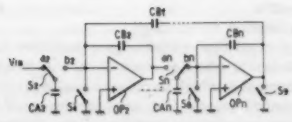
means coupled to said detecting means for determining variations in magnitude of said field from said observable property.

4,429,281

INTEGRATOR FOR A SWITCHED CAPACITOR-FILTER

Akihiko Ito, Kawasaki; Kazuhiro Kobayashi, Tokyo; Hisami Tanaka, Yokohama, and Norio Ueno, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 5, 1980, Ser. No. 213,399
Claims priority, application Japan, Dec. 5, 1979, 54-168361[U]
Int. Cl.³ H03F *1/00*
U.S. Cl. 330—9 **6 Claims**



1. A switched capacitor-filter, comprising:

m integrators, where m is an integer greater than or equal to 2, where an input of the first integrator is an input of said switched capacitor-filter, an output of the mth integrator is an output of said switched capacitor-filter and the output of the m-1th integrator is operatively connected to the input of the mth integrator, each of said m integrators including:

a switched capacitance, including:

a switching element, having a first switchable terminal operatively connectable as the input of the mth integrator, having a second switchable terminal and having a non-switchable terminal, which is periodically switched between the switchable terminals; and

a capacitor, operatively connected to the non-switchable terminal of said switching element, which is charged by the input voltage and discharged through the second switchable terminal of said switching element;

an operational amplifier having a first input operatively connected to the second switchable terminal of said switching element of said switched capacitance for receiving the charge discharged from said switched capacitance, having a second input operatively connected to a reference potential and having an output which is the output of the mth integrator;

an integrating capacitor operatively connected between the output and the first input of said operational amplifier; and

a reference switching element, operatively connected between the first input of said operational amplifier and the reference potential, so that the potential at the first input of said operational amplifier is made equal to the reference potential when said reference switching element is closed;

a feedback integrating capacitor operatively connected between the input of the operational amplifier of the first integrator and the output of the mth integrator; and

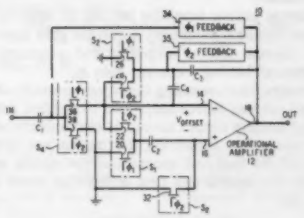
an output switching element operatively connected between the output of the mth integrator and the reference potential.

4,429,282

OFFSET-NULLED SAMPLE-AND-HOLD AMPLIFIER

Veikko R. Saari, Spring Lake Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1982, Ser. No. 346,643
Int. Cl.³ H03F *1/00*
U.S. Cl. 330—9 **4 Claims**



1. An amplifier circuit including an operational amplifier having an inverting input port, a non-inverting input port and an output port, said circuit comprising a switched capacitor offset voltage compensation network to compensate for the voltage offset of said operational amplifier, said network being CHARACTERIZED BY:

an offset voltage storage capacitor, one side of which is connected at said non-inverting input port;

means for connecting the other side of said offset voltage storage capacitor to a reference voltage in response to a first electrical pulse train and to said inverting input port in response to a second electrical pulse train, non-overlapping said first pulse train;

a signal hold capacitor connected at a first, output side to said output port;

means for connecting the other, input side of said signal hold capacitor to said reference potential in response to said first pulse train and to said inverting input port in response to said second pulse train;

means for connecting said non-inverting input port to said reference potential in response to said second pulse train and disconnecting said non-inverting input port from said reference potential in the absence of the pulses of said second pulse train; and

means for providing a signal input to said inverting input port.

4,429,283

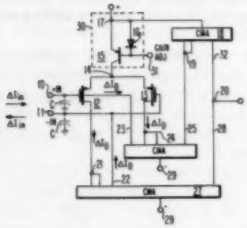
DIFFERENTIAL CURRENT AMPLIFIER

Harold A. Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,434

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—257 **10 Claims**



1. A current amplifier comprising:

a current bias source;

a differential input circuit having a common terminal, first and second differential input terminals and first and second differential current output terminals, wherein output signal at said second output terminal is in phase with signal applied to said first differential input terminal;

means connecting the current bias source to said common terminal;

a first current mirror amplifier having an input terminal and an output terminal;

a second current mirror amplifier having an input terminal, a first output terminal exhibiting a current gain equivalent to said first current mirror amplifier and a second current output terminal having a current gain A;

respective means for connecting the input terminals of the first and second current mirror amplifiers to the first and second differential current output terminals respectively; and

respective means for connecting the output and first output terminals of the first and second current mirror amplifiers directly to the second and first differential input terminals respectively.

4,429,284

OPERATIONAL AMPLIFIER

Carl F. Wheatley, Jr., Drums, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,059

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **5 Claims**

1. A differential amplifier comprising:

means for applying supply potential;

first and second input terminals and an output terminal;

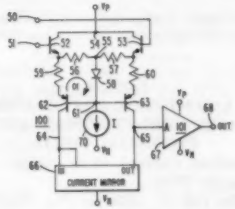
a bias current source;

first and second transistors of a first conductivity type, each having respective first and second electrodes and a principal conduction path therebetween, and respective control electrodes, the principal conduction paths being controlled by potential applied between the respective control and first electrode;

respective means for connecting the second electrodes of said first and second transistor to the means for applying supply potential and for connecting the respective control electrodes to the first and second input terminals respectively;

third and fourth transistors of a conductivity type complementary to said first type each having respective first and second electrodes and a principal conduction path therebetween, respective control electrodes, and potential applied between the control and first electrodes controlling the respective principal conduction paths;

means for connecting the control electrodes of the third and fourth transistors to said bias current source;



load means connected to the second electrodes of the third and fourth transistors and means for connecting the second electrode of the fourth transistor to said output terminal;

first and second matched resistive means for respectively connecting the first electrodes of the first and third transistors, and for connecting the first electrodes of the second and fourth transistors;

third and fourth matched resistive means serially connected, without intervening elements, between the first electrodes of the first and second transistors;

and

a single potential offset means connected between the interconnection of said third and fourth resistive means and the control electrodes of said third and fourth transistors.

4,429,285

FREQUENCY-CONTROLLED VARIABLE-GAIN AMPLIFIERS

John L. Bradshaw, Hatboro, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,686

Int. Cl.³ H03G *3/10*; H03F *1/34*

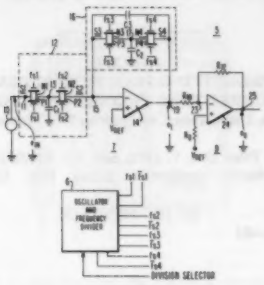
U.S. Cl. 330—279 **12 Claims**

1. The combination comprising:

a frequency controlled variable gain amplifier having an input terminal to which an input signal may be applied, an output terminal at which an output signal is produced, and a gain control means, said amplifier being of the type whose voltage gain is a function of the frequency of a sampling signal applied to said gain control means; and

means, coupled between said output terminal and said gain control means, responsive to the amplitude of said output signal for producing a variable frequency gain control

signal whose frequency is a function of said amplitude of said output signal and for applying said gain control signal



to said control means for controlling the gain of said amplifier.

4,429,286

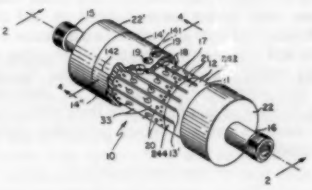
DIVIDER/COMBINER AMPLIFIER

Lawrence J. Nichols, Burlington, and George H. MacMaster, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 310,011, Oct. 13, 1981. This application Apr. 19, 1982, Ser. No. 369,942

Int. Cl.³ H03F 3/60

U.S. Cl. 330—286 **11 Claims**



1. A microwave amplifier comprising:

a first waveguide means;

an amplifying means connected to said first waveguide means to form a waveguide amplifier having an input and an output;

a plurality of said waveguide amplifiers having their inputs and outputs connected in parallel;

means adjacent said first waveguide providing a second waveguide between each pair of adjacent first waveguides of said waveguide amplifiers which prevents the operating mode of each of said waveguide amplifiers from propagating through said second waveguide means;

a microwave absorber terminating each second waveguide;

said absorber absorbing the microwave energy transmitted through said second waveguide from said first waveguide means; and

a portion of said first waveguide means including said amplifying means removably connected to the remainder of said first waveguide portion.

4,429,287

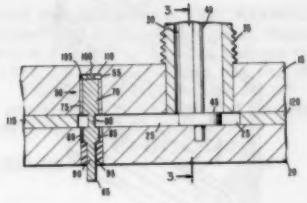
COAXIALLY COUPLED TUNABLE OSCILLATOR USING A RIDGE WAVEGUIDE

Ralston S. Robertson, Jr., Reseda, and Robert L. Eisenhart, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 11, 1981, Ser. No. 272,808

Int. Cl.³ H03B 7/14

U.S. Cl. 331—107 DP **8 Claims**



1. A broadband microwave structure for efficiently coupling power from a solid-state power source to a load, including in combination:

(a) a waveguide having top and bottom walls and tuning means at opposite ends thereof;

(b) a coaxial output line, having an outer conductor connected to the top waveguide wall and an inner conductor connected to the bottom waveguide wall, for coupling power to a load;

(c) an impedance-matching step integrally joined with said inner conductor of the coaxial output line and disposed between the top and bottom waveguide walls;

(d) the top and bottom waveguide walls having aligned openings therein adjacent one of the tuning means; and

(e) a frequency selective elongated oscillator module mounted in the aligned openings and electromagnetically coupled to the waveguide for coupling microwave power to the coaxial output line.

4,429,288

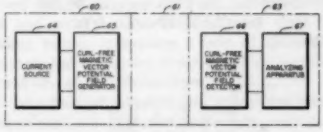
APPARATUS AND METHOD FOR MODULATION OF A CURL-FREE MAGNETIC VECTOR POTENTIAL FIELD

Raymond C. Gelinas, Concord, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 198,380

Int. Cl.³ H03C 1/00

U.S. Cl. 332—51 R **6 Claims**


CURRENT SOURCE
CURL-FREE MAGNETIC VECTOR POTENTIAL FIELD GENERATOR
CURL-FREE MAGNETIC VECTOR POTENTIAL FIELD DETECTOR
ANALYZING APPARATUS

1. Apparatus for generating a modulated curl-free magnetic vector potential field A comprising:

a configuration of at least one conducting element adapted to generate a magnetic vector potential field surrounding said conducting element configuration when current is applied to said conducting element configuration, a substantial portion of said vector field having a curl-free magnetic vector potential A (defined by CURL A=0) component;

a current source coupled to said conducting element configuration for applying current thereto; and

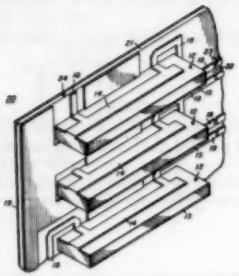
modulating means for controlling current from said current source.

4,429,289

HYBRID FILTER

Robert J. Higgins, Jr., Sunrise, and Harvey N. Turner, Jr., Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 1, 1982, Ser. No. 383,418
Int. Cl.³ H01P 1/203, 7/08, 5/00
U.S. Cl. 333—204 5 Claims



1. An improved hybrid filter arrangement, comprising in combination:

a plurality of removably mountable resonator modules including an insulating board with a ground plane on one side thereof and a resonant conductor on the other side;

a mounting substrate having an insulating board with a ground plane on one side and a plurality of conductors on the other side, said substrate further including means for releasably mounting said plurality of resonator modules in a manner to effect interconnection and coupling therebetween;

said coupling being accomplished by pairs of conductors on said substrate in proximity to one another along a length thereof at one end and being in electrical contact with a resonant conductor of a respective resonator module at the other end when said modules are mounted on said substrate;

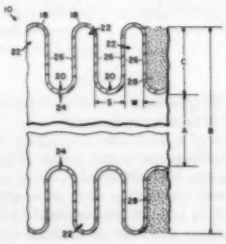
said pairs of conductor being trimmable to alter the frequency response of said hybrid filter after the assembly thereof.

4,429,290

FLEXI-BEND CORRUGATED WAVEGUIDE

Joseph M. Devan, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1979, Ser. No. 89,058
Int. Cl.³ H01P 3/13, 3/14
U.S. Cl. 333—241 11 Claims



1. In a circular waveguide for propagating electromagnetic energy, in the TE_{01} mode, the improvement comprising:

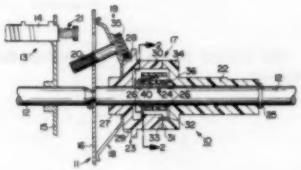
a pipe having corrugated walls, said corrugated walls comprising a plurality of adjacent internal ridges and valleys, having substantially parallel walls, the distance between said substantially parallel walls of said ridges being at least twice the distance between said substantially parallel walls of said valleys.

4,429,291

ROTARY PRE-SETTING FINE TUNING DEVICE FOR A TURRET TYPE TELEVISION TUNER

Kaoru Tenjin, Ueno, Japan, assignor to NEC Kansai, Ltd., Otsu, Japan

Filed Dec. 9, 1981, Ser. No. 329,022
Claims priority, application Japan, Dec. 15, 1980, 55-180576[U]
Int. Cl.³ H03J 5/26
U.S. Cl. 334—51 7 Claims



1. A television tuner of the turret type comprising a selector shaft carrying a rotatable turret in a chassis, said turret including a plurality of tuning coil units corresponding to different television channels, each tuning coil unit having an adjustment element, and memory fine tuning means for adjusting any one of said adjustment elements when said rotatable turret is in a predetermined position, said fine tuning means comprising, fine tuning driving means mounted concentrically around said selector shaft, said fine tuning driving means including a fine tuning shaft, slide gear means and cam surface means for rotatably connecting said slide gear means to said fine tuning shaft, slip clutch means rotatably connected to said slide gear means, said slip clutch means including a plastic collar member loosely mounted around said selector shaft and a metallic sheet member inserted in a gap formed between said collar member and said selector shaft; spring means located on said chassis for normally biasing said slide gear means in a direction away from said chassis; and idler means supported in said spring means for transmitting rotary movement from said fine tuning driving means to said adjustment element and for responding to a continuous rotation of said fine tuning shaft which rotates said slide gear means whereby a rotary pre-setting memory fine tuning is provided.

4,429,292

RETAINING PLATE FOR USE IN A MAGNET SYSTEM OF A RELAY

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,452
Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120117
Int. Cl.³ H01H 45/00
U.S. Cl. 335—202 9 Claims

1. A magnet system for an electromagnetic relay comprising:

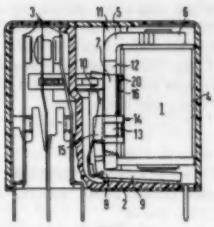
an electromagnetic coil having a central axis;

a relay base body having side walls with longitudinal grooves therein;

an angled yoke having a yoke leg parallel to said coil axis and having a plurality of pairs of lugs carried on said yoke leg received in said longitudinal grooves of said relay base body for positioning and mounting said yoke; and

a retaining plate comprised of resilient metal, said retaining plate disposed between said yoke leg and said coil, said

retaining plate having a central portion supported against said yoke leg and having a pair of bent lateral flanges



engaged in said longitudinal grooves of said relay base body.

4,429,293

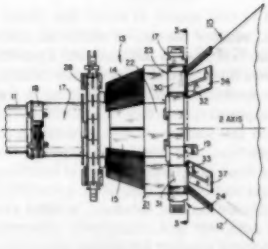
PINCUSHION RASTER CORRECTOR DISTORTION WITH IMPROVED PERFORMANCE

Kenneth W. McGlashan, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1983, Ser. No. 494,468

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—211 **7 Claims**



1. A television display system comprising:

a kinescope incorporating a neck, an electron gun assembly for producing an electron beam located within said neck, a display screen, and a funnel located intermediate said neck and said display screen;

a deflection yoke mounted on said neck of said kinescope and incorporating horizontal and vertical deflection coils adapted for coupling to a source of deflection signals for forming deflection fields within said deflection yoke for deflecting an electron beam to form a raster on said display screen and forming stray fields external to said deflection yoke; and

a field shaping apparatus comprising:

magnetically permeable flux gathering members disposed on opposite sides of said deflection yoke and located within the region of said stray fields for providing a low reluctance path for the flux of said stray fields;

magnetically permeable flux directing members extending along and adjacent to the surface of said funnel of said kinescope for forming an electromagnetic field within the interior of said kinescope between respective ones of said flux directing members for influencing the motion of said electron beam; and

magnetically permeable flux channeling members coupled between said flux gathering members and said flux directing members for providing a low reluctance path from said flux gathering members to said flux directing members, each of said flux channeling members incorporating a first portion extending generally along the longitudinal axis of said kinescope and a transverse portion extending generally perpendicular with respect to said longitudinal axis of said kinescope, said transverse portion extending inwardly toward said kinescope and terminating adjacent to said funnel of said kinescope so as to intensify said field formed within the interior of said kinescope between said respective ones of said flux directing members.

4,429,294

COIL FORM FOR ELECTRIC WINDINGS

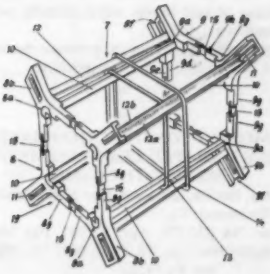
Harald Meffert, Dusseldorf, and Rolf Pieper, Wuppertal-Ronsdorf, both of Fed. Rep. of Germany, assignors to Firma W. Meffert KG., Erkrath-Unterfeldhaus, Fed. Rep. of Germany

Filed Mar. 23, 1981, Ser. No. 246,195

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010823; Mar. 19, 1981, 8108092[U]

Int. Cl.³ H01H *85/02*

U.S. Cl. 336—198 **13 Claims**



1. A coil form for a transformer having air-cooled electric windings, said coil form comprising:

a first set of profiled bars having a selectively variable length and substantially constant cross-section for simultaneously supporting an iron core and at least a first, inner coil winding;

a second set of profiled bars having a selectively variable length and a substantially constant cross-section for supporting a second coil winding spaced from the first winding;

means for removably holding said first and second sets of supporting bars in a spaced, substantially parallel relationship whereby an air gap is formed between the first and second coil windings, said holding means delimiting said first and second supporting means at their faces, said holding means comprising a pair of spaced, framelike members and means for removably holding said first and second sets of bars therebetween; and

means for selectively varying the vertical and lateral dimensions of said pair of spaced framelike members.

4,429,295

VARIABLE IMPEDANCE CURRENT LIMITING DEVICE

Jiing-Liang Wu, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 13, 1981, Ser. No. 321,237

Int. Cl.³ H01H *87/00*

U.S. Cl. 337—119 **17 Claims**

1. A variable impedance current limiting device, comprising:

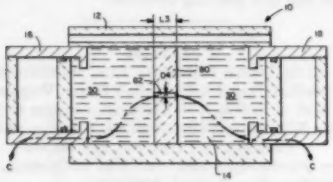
a housing defining a chamber therein;

a pair of spaced electrical terminals respectively located at opposite ends of said housing and disposed in communication with said chamber;

an electrically conductive fusible metal disposed in said

chamber to provide an electrically conductive path between said terminals;

an insulating member disposed in said chamber between the opposite ends of said housing defining a flow passageway that provides communication between said terminals across said chamber, said flow passageway extending substantially through the center of said insulating member



and the diameter of said flow passageway being approximately equal to the length of said flow passageway wherein with the occurrence of an overload current, vaporization of said fusible metal initially occurs in said flow passageway; and

expansion means for buffering the pressure rise in said chamber when said fusible metal is vaporized.

4,429,296

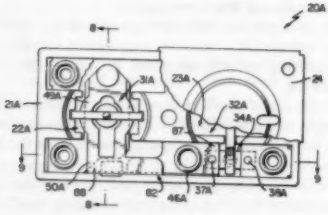
THERMOSTAT CONSTRUCTION HAVING A ONE-PIECE V-SHAPED LEAD AND METHOD OF MAKING THE SAME

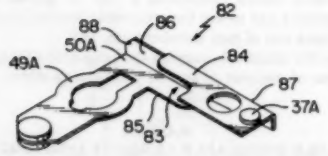
Paul M. Rowley, Bexley, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 250,576, Apr. 3, 1981, Pat. No. 4,365,228. This application Jun. 14, 1982, Ser. No. 388,128

Int. Cl.³ H01H *37/02*

U.S. Cl. 337—338 **10 Claims**





1. In a control device having a housing carrying a pair of thermostatically operated electrical switch means therein in spaced apart side-by-side relation and being electrically interconnected together in series by a one-piece lead means carried internally in said housing and having opposed ends and an intermediate portion while being secured to said housing intermediate said ends thereof whereby said ends are disposed in cantilever fashion with said ends respectively forming part of said switch means, the improvement wherein said intermediate portion of said lead means has a substantially U-shaped cross-sectional configuration defined by a cross member and a pair of substantially parallel spaced apart legs extending outwardly from said cross member, one of said legs having a movable switch blade integral therewith at one of said opposed ends of said lead means and extending outwardly therefrom for its respective switch means, the other of said legs carrying a fixed contact means for the other switch means at the other of said opposed ends of said lead means whereby said switch blade and said fixed contact means are disposed in offset planes by said legs of said one-piece lead means.

4,429,297

VARIABLE RESISTOR

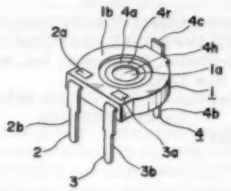
Yoshiyuki Nakatsu, Osaka, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 29, 1981, Ser. No. 278,362

Claims priority, application Japan, Jul. 3, 1980, 55-91575

Int. Cl.³ H01C *10/32*

U.S. Cl. 338—162 **16 Claims**



1. A variable resistor for use in electrical and electronic equipment which comprises a substrate and a pair of fixed side terminal members integrally molded in said substrate, each of said fixed side terminal members including a forward end portion that is exposed at a surface of said substrate, a resistant layer formed on the surface of said substrate and including opposite end portions that meet said exposed forward end portions of said fixed side terminals and at interfaces therebetween are in electrical contact therewith, a variable side terminal member provided on said substrate, a slider movably disposed on said substrate and electrically connected to said variable side terminal member for sliding movement over said resistant layer so as to adjust resistance of said variable resistor, each of said fixed side terminal members having a solder coating material thereon at predetermined portions thereof, each of said fixed side terminals being void of said solder coating material at the interface between its said exposed forward end portion and said resistant layer.

4,429,298

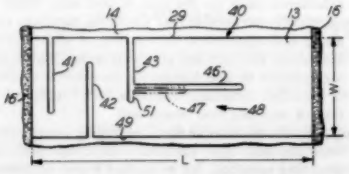
METHODS OF TRIMMING FILM RESISTORS

David J. Oberholzer, Bethlehem, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,658

Int. Cl.³ H01C *10/00*

U.S. Cl. 338—195 **8 Claims**



1. A method of trimming a film resistor having a rectangular

resistive layer bounded laterally by spaced reference edges extending generally in the direction of an intended current flow through said resistor, the method comprising:

progressively cutting into the resistive layer, thereby forming at least one plunge cut commencing at one of said spaced reference edges and extending toward the other;

monitoring the resistance, and any change therein, of said resistor while forming said at least one plunge cut;

terminating said cutting to form said at least one plunge cut at a first predetermined distance from said one reference edge, unless a first predetermined target resistance value is detected by said monitoring step prior to said at least one plunge cut progressing to said first predetermined distance, and in the event of said monitoring step detecting said first predetermined target resistance, terminating said progressively cutting into said resistive layer with said at least one plunge cut; thereafter

progressively cutting the resistive layer with a trim cut originating at said at least one plunge cut which is most recently formed and proceeding in a direction parallel to said spaced reference edges and at a second predetermined distance from said one of said spaced reference edges, said second predetermined distance being less than the distance to which said most recently formed of said at least one plunge cut extends into said resistive layer; and

terminating progressively cutting the resistive layer with said trim cut upon said resistor reaching a second predetermined target resistance.

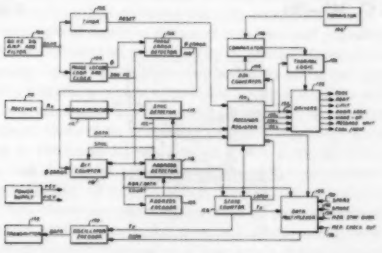
4,429,299
TWO-WAY AC POWER LINE COMMUNICATIONS SYSTEM

Jules M. Kabat, and James H. Beggs, both of Las Vegas, Nev., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 992, Jan. 5, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,608

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 R **35 Claims**



1. A two way data transmission communication system for effecting two way transmission of data on an AC power line which has interferring noise thereon and which is located within a building or building complex comprising:

a plurality of transceivers each of which is located in a different room or area of said building or building complex and connected to said AC power line for transmitting data between the transceivers each of said transceivers having a transmit mode and a receive mode during the operation thereof, each of said transceivers further having:

(1) a receiver means for detecting address signals transmitted over the neutral and ground of the AC power line associated with said building or building complex;

(2) means for accumulating data from various external sources;

(3) transmitter means for transmitting a return signal over the neutral and ground of said AC power line, said return signal being representative of the data accumulated by said transceiver;

(4) means for initiating transmission of said return signal upon receipt of a preselected address signal, said system further including a central processing unit having

means for selectively polling each of said transceivers by transmitting over the neutral and ground of said AC power line an address signal which is representative of the transceiver being polled,

receiver means for detecting return signals transmitted over the neutral and ground of said AC power line; and

means for processing said return signals.

4,429,300
HIGH SPEED SHIFT REGISTER CIRCUIT

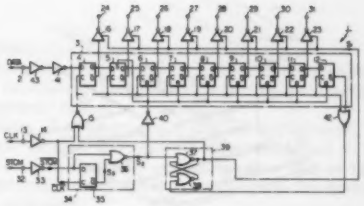
Masao Yamasawa, Kawasaki, and Tetsuo Soejima, Musashino, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 52,259, Jun. 26, 1979. This application Apr. 15, 1982, Ser. No. 368,829

Claims priority, application Japan, Jun. 26, 1978, 55-76380

Int. Cl.³ H03K *13/256*

U.S. Cl. 340—347 DD **7 Claims**



1. A shift register circuit for receiving a start command signal and for converting the format of N bit data, where, comprising:

a shift register having a capacity of at least N+1 bits and having a rear end at the first bit position, for performing shift operations on a serial data stream of continuous N bit data which is applied to the N+1th bit position of said shift register;

first means, operatively connected to said shift register, for setting said shift register to a predetermined condition by generating a start signal, in dependence upon the start command signal, representing a start time for a converting operation of the shift register circuit, said predetermined condition being that the content of a Kth ($K \leqq N$) bit position from said rear end of said shift register is a logical state and the individual contents from the rear end bit position to the K−1th bit position of said shift register are a second logical state;

second means, operatively connected to said shift register, for detecting whether or not said shift register has carried out said shift operations depending upon the contents of said shift register, and for providing an output signal;

a gate circuit, operatively connected to said shift register, for controlling the application of a shift pulse to said shift register, said gate circuit being operated so as to be opened in dependence upon said start signal and closed in dependence upon said output signal from said second means.

4,429,301
MEANS FOR DECODING A SWITCH ARRAY

J. A. Crumley, Enola, and John P. Weaver, Lancaster, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1981, Ser. No. 314,600

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 S **8 Claims**

1. Apparatus for decoding a switch array comprises:

a first linear conductor having a first plurality N_x of individual resistors in series thereon, each resistor having the

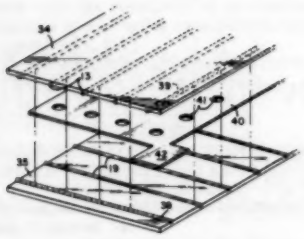
same constant value R, said conductor having a first end and a second end,

a like first plurality N_x of first parallel crossbar conductors connected to said first linear conductor, each said crossbar conductor being connected adjacent to one of said resistors toward said second end,

a second linear conductor having a second plurality N_y of individual resistors in series thereon, each resistor having the same constant value R as those on said first linear conductor, said conductor having a first end and a second end,

a like second plurality of second parallel crossbar conductors connected to said second linear conductor, each said crossbar conductor being connected adjacent to one of said resistors toward said second end,

switchable connections between each of said first parallel crossbar conductors and each of said second parallel crossbar conductors, whereby, any of said first crossbar conductors is switchably connectable to any of said second crossbar conductors,



a source of constant current I at said first end of said first linear conductor,

ground means at said first end of said second linear conductor,

means for indicating the potential E_1 at the first end of said first linear conductor adjacent said current source toward said second end,

means for indicating the potential E_2 at the second end of said second linear conductor, whereby, upon closing a switchable connection, a constant current I will pass through a portion of said first linear conductor, through said switchable connection, and through a portion of said second linear conductor to ground, whereby the number N_x, N_y of resistors on said first and second linear conductors respectively through which current passes may be determined according to the formulas $N_x=(E_1-E_2)/IR$ and $N_y=E_2/IR$, whereby the location of said closed switchable connection may be determined.

4,429,302

ELECTRONIC SECURITY SYSTEM WITH NOISE REJECTION

Jan Vandebult, Topsfield, Mass., assignor to I. D. Engineering, Inc., Ipswich, Mass.

Filed Oct. 8, 1981, Ser. No. 309,715
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 **10 Claims**

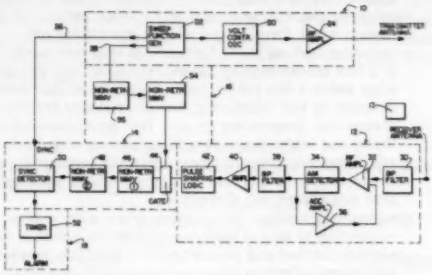
1. An electronic security system comprising:

transmitter means for producing an electromagnetic field at a frequency repetitively swept through a predetermined range at a predetermined sweep frequency;

a resonant tag circuit having a resonant frequency within the sweep range;

receiver means for producing an output signal in response to a tag signal produced by said tag circuit each time the field produced by said transmitter means passes through said resonant frequency;

circuit means for producing a pulse in response to selected output signals of said receiver means, said selected output signals being an initial output signal and each successive output signal which occurs at an interval from the previous selected output signal which is at least as great as the period of said sweep frequency; and



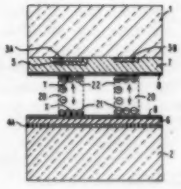
means for comparing the frequency of pulses produced by said circuit means with said sweep frequency and producing an alarm signal when said pulse frequency and said sweep frequency are substantially equal.

4,429,303

COLOR PLASMA DISPLAY DEVICE

Mohamed O. Aboelfotoh, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,156
Int. Cl.³ G09G *3/28*
U.S. Cl. 340—701 **8 Claims**



1. A multicolor plasma display device comprising in combination,

a pair of plate glass substrates,

a conductor array formed on each of said substrates, said conductor arrays comprising a plurality of parallel conductors,

said substrates being sealed with said conductor arrays in orthogonal relationship, the intersections of said conductors designating the discharge sites of said device,

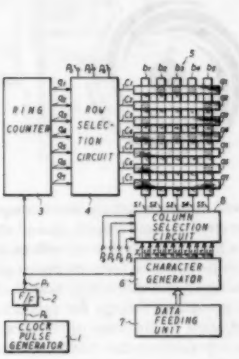
a dielectric coating over each of said conductor arrays, at least one of said dielectric coatings being composed of a layer of electroluminescent phosphor,

and means responsive to the selective application of signals to said conductor arrays, said means comprising a layer of n-type semiconductor material selectively interposed between said conductors and said electroluminescent phosphor, for lowering the threshold voltage for electroluminescence of said plasma display device, thereby providing discharge and color light emission at selected discharge sites.

4,429,304
DISPLAY DRIVING DEVICE

Masanori Fujita, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 72,333, Sep. 5, 1979, abandoned. This application Apr. 21, 1981, Ser. No. 256,045
Claims priority, application Japan, Sep. 6, 1978, 53-110166
Int. Cl.³ G09G 3/18
U.S. Cl. 340—765 3 Claims



1. A display and driving circuit, comprising:

a plurality of first electrodes disposed in a regular array adjacent one another;

a plurality of second electrodes disposed in a regular array adjacent one another, said plurality of second electrodes disposed over said plurality of first electrodes with the second electrodes crossing the first electrodes;

an electroptical medium disposed between said plurality of first electrodes and said plurality of second electrodes and having optical properties responsive to electrical potentials, wherein a region of said electroptical medium where a first electrode and a second electrode cross defines a picture element for displaying visual information according to electrical signals applied to the crossing first and second electrodes, and said plurality of first electrodes and said plurality of second electrodes crossing said plurality of first electrodes defining an array of picture elements;

selection circuit means for selecting successive groups of first electrodes comprising at least a pair of first electrodes and for simultaneously applying different respective voltage signals to the first electrodes comprising the successively selected groups of first electrodes;

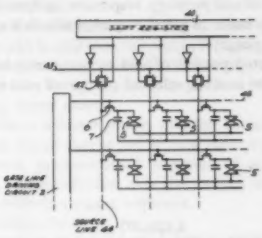
signal supply means responsive to control signals for simultaneously applying respective selected electrical signals to said second electrodes under control of said control signals for energizing selected picture elements defined by the selected group of said first electrodes and said second electrodes according to the selected electrical signals applied to said second electrodes; and

data signal generating means for generating data signals in parallel bit format, equal in number to the number of first electrodes comprising the successively selected groups of first electrodes and corresponding to a pattern to be visually displayed and for applying the bits of successive ones of said data signals to said signal supply means as successive control signals for enabling picture elements defined by said selected group of first electrodes and said second electrodes to visually display the pattern represented by said data signals.

4,429,305
LIQUID CRYSTAL DISPLAY SYSTEM

Minoru Hosokawa; Koichi Oguchi, and Satoru Yazawa, all of Suwa, Japan, assignors to Kabushiki, Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,354
Claims priority, application Japan, May 30, 1979, 54-67233
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 13 Claims



1. A liquid crystal display circuit comprising:

a plurality of liquid crystal picture elements being arranged in a fixed pattern, each picture element being connected to a transistor formed on a substrate;

a plurality of common source lines on said substrate, the source of each said transistor being connected to one source line, a plurality of said transistor sources being connected to every source line, said source line having a low resistance;

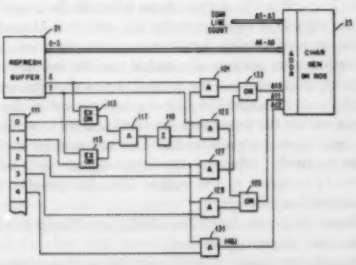
a plurality of common gate lines, the gate of each said transistor being connected to one gate line, a plurality of said transistor gates being connected to every gate line;

switching means having input and output terminals associated with said source lines for sampling image signals, the output terminal of each said switching means being connected directly to an associated source line, image signals sampled by said switching means being held or stored by the capacitance of said source lines with said substrate, the low resistance of said source line providing a short time constant for charging said capacitance.

4,429,306
ADDRESSING SYSTEM FOR A MULTIPLE LANGUAGE CHARACTER GENERATOR

George C. Macauley, Concord; William F. Nemecek, Charlotte, and Robert W. Roefer, both of Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 11, 1981, Ser. No. 300,880
Int. Cl.³ G09G 1/00
U.S. Cl. 340—790 6 Claims



1. A method of retrieving picture elements from a character

generating memory for display of a symbol comprising the steps of:

providing a first plurality of bits of a display character code as part of an address to an address input of said memory;

providing at least one compare bit:

comparing another bit of said display character code with said compare bit and;

substituting a plurality of bits for said another bit of said display character code as another part of said address to said address input of said memory, responsive to the result of said comparison in order to select a symbol which is special to a particular language;

whereby a selected portion of said memory may be accessed alternatively to another selected portion of said memory.

4,429,307

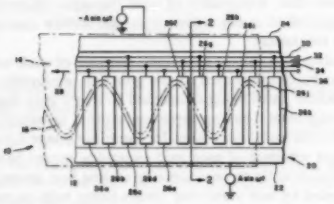
CAPACITIVE TRANSDUCER WITH CONTINUOUS SINUSOIDAL OUTPUT

Stephen M. Fortescue, Canoga Park, Calif., assignor to Data-products Corporation, Woodland Hills, Calif.

Filed Jan. 29, 1982, Ser. No. 343,726

Int. Cl.³ G08C *19/10*

U.S. Cl. 340—870.37 **10 Claims**



1. A rotary capacitive transducer, comprising:

a stationary disc including a first conductive annular input area near the center of the disc, a second conductive annular input area near the edge of the disc and first and second conductive output areas extending radially between the input areas;

a movable disc which is adjacent to, concentric with and rotatable with respect to the stationary disc, said movable disc including first and second conductive annular coupling areas, wherein the first coupling area overlaps the first input area and extends radially outward so as to overlap the output areas, the second coupling area overlaps the second input area and extends radially inward so as to overlap the output areas, wherein the coupling areas are separated by an annular gap which is shaped so that the area of overlap between each coupling area and each output area various sinusoidally as the movable disc rotates, and wherein the output areas are spaced apart a distance corresponding to one half period of the gap;

input means for providing first and second complementary input carrier signals to the first and second input areas, respectively, whereby the input signals will be capacitively coupled to the output areas to provide first and second output signals;

differential means for differentially combining the first and second output signals; and

demodulator means for demodulating the output of the differential means to thereby provide a sinusoidal transducer output.

4,429,308

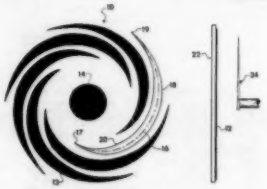
ELECTRODE OR POLE PIECE ARRAY FOR CREATING PRESCRIBED ELECTRIC OR MAGNETIC FIELDS

Arthur T. Shankle, Raleigh, N.C., assignor to Charles J. Cain, Greenville, N.C.

Filed Sep. 30, 1976, Ser. No. 728,119

Int. Cl.³ G08C *19/10, 19/00, 19/06*

U.S. Cl. 340—870.37 **8 Claims**



1. An improved electrode arrangement comprising a circular array of discrete, arcuately shaped, spaced electrodes lying substantially in a plane and interleaved with each other in such a manner that any given radius from the center of the array will intersect a plurality of said electrodes, said electrodes further connected to a polyphase voltage for producing an electric field in space adjacent to the plane of the array in which the resultant vector representing the maximum field strength rotates, a radially extending, symmetrical plate member positioned in said electric field and revolving in a given reference plane parallel to the plane of said array, said electric field producing a resultant signal on said plate member which varies substantially sinusoidally with time, and the phase of said resultant signal with respect to any one of the drives of the polyphase voltage being a substantially linear function of the angular position of said plate member when said electrodes are connected to said polyphase voltage.

4,429,309

TRACKING FILTER SYSTEM FOR USE WITH A FM/CW RADAR

Ronald W. Kipp, Croydon, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,434

Int. Cl.³ G01S *13/32*

U.S. Cl. 343—7 PL **6 Claims**

2. A range measuring system comprising in combination:

means producing a continuous wave radio frequency (RF) signal which is modulated in accordance with a preselected parameter;

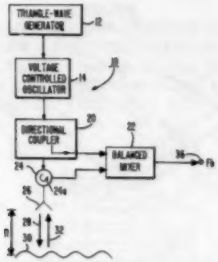
means for transmitting said RF signal toward a target, the range of which is to be measured, and for receiving a return reflected signal therefrom;

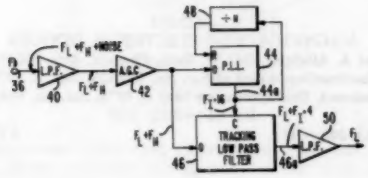
means for subtractively mixing said transmitted signal and return signal to produce a beat frequency signal which contains a frequency A corresponding to said range and a different undesired frequency X;

means responsive to said frequencies A and X for producing a control signal corresponding to a frequency intermediate A and X; and

a tracking filter responsive to said control signal and to said

beat frequency signals for passing only frequencies above or below said intermediate frequency and responsive to





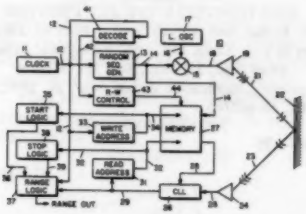
said beat frequency signal for passing frequency A and rejecting frequency X.

4,429,310

RANDOM BINARY WAVEFORM ENCODED RANGING APPARATUS

John W. Zscheile, Jr., Farmington, and Steven L. Bennett, Salt Lake City, both of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,448
Int. Cl.³ G01S *13/08*
U.S. Cl. 343—13 R **7 Claims**



1. A ranging apparatus employing an encoded waveform signal comprising:

a binary fixed frequency clock,

a random sequence generator driven by said clock for producing random bits of information in serial form,

a local oscillator for producing a carrier wave signal,

a mixer coupled to said local oscillator and said random bits of information for producing a random bit modulated signal,

transmitter means coupled to said random bit modulated signal,

receiving means adapted to receive reflected and returned delayed attenuated signals representative of said random bit modulated signals,

random access memory means of the type having address means, input-output data means and read-write control means,

a write address counter coupled to said fixed frequency clock and said memory for generating a predetermined sequence of addresses in said memory,

said random sequence generator being coupled to said memory for supplying said bits of information to the addresses generated by said write address counter,

code locked loop means for producing a variable frequency signal output,

said code locked loop means being coupled to said receiving means and to said memory means for comparing the bits of information being read out of memory with the bits of information being received to produce said variable frequency signal output,

read address counter means coupled to said variable frequency signal output and to said memory for producing the same predetermined sequence of addresses as said write address counter at a time which occurs after said write address counter sequence,

range computing logic,

start epoch means coupled to said range computing logic and to said write address counter for producing a signal for starting said range computing logic when a predetermined epoch address is present,

stop logic means coupled to said range computing logic and to said read address counter for producing a signal for stopping said range computing logic when the same predetermined epoch address is present at a subsequent time, and

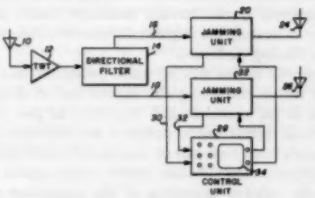
said read-write control means including means for alternately reading and writing bits of information from and to said memory at the addresses designated by the read address counter and the write address counter.

4,429,311

DUAL BEAM RADAR JAMMING SYSTEM

James R. Barewald, Mountain View, Calif., assignor to Itek Corporation, Sunnyvale, Calif.

Filed Nov. 6, 1970, Ser. No. 88,997
Int. Cl.³ G01S *7/38*
U.S. Cl. 343—18 E **8 Claims**



1. A dual beam radar jamming system, comprising:

radar receiver means responsive to input radar signals having freqencies within a first frequency band including a first sub-band and a second sub-band and operative to develop a broad band signal commensurate therewith;

directional filter means responsive to said broad band signal and operative to separate first radar signals having frequencies within said first sub-band and second radar signals having frequencies within said second sub-band;

control means for developing a first control signal and a second control signal;

first repeater means responsive to said first control signal and operative to amplitude modulate said first radar signals to develop first jamming signals; and

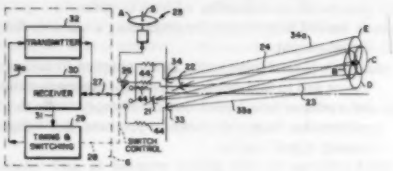
second repeater means responsive to said second control signal and operative to amplitude modulate said second signals to develop second jamming signals.

4,429,312

INDEPENDENT LANDING MONITORING SYSTEM

John P. Chisholm, P.O. Box 2122, Olympic Valley, Calif. 95730

Filed Jul. 24, 1981, Ser. No. 286,312
Int. Cl.³ G01S *1/16*
U.S. Cl. 343—410 **11 Claims**



1. A guidance system for airborne vehicles on a final approach landing path, comprising

(a) ground-based means having transmitter means operative to deliver pulse sequences, each sequence comprising multiple guidance pulse signals having predetermined time spacings, and the sequences occurring at spaced time intervals;

(b) said ground-based means having antenna means including plural directional radiating means directed to radiate signals upwardly along and adjacent to the final approach landing path, the radiating means being arranged in pairs operative to radiate paired guidance signals with respect to the landing path;

(c) said ground-based means having pulse signal timing and switching means coupled to trigger the transmitter means and to connect it to the antenna means, the timing and switching means being operative to couple a different directional radiating means to the transmitter means to radiate each successive guidance pulse signal in a sequence of pulse signals, thereby to identify the directional radiating means in accordance with the time position in the sequence of the guidance pulse signal which it radiates;

(d) airborne means having receiver means operative to receive and detect the radiated pulse signals in the sequence;

(e) said airborne means having indicator means having means for indicating the degree of deviation of the vehicle from the landing path; and

(f) said airborne means having pulse processor means responsive to the received pulse signals and to their time positions in the sequence and operative to pair the received pulse signals and to compare the intensities of the pulse signals from each pair of directional radiating means and to deliver to the indicator means output signals representing the relative intensities of the respective paired pulse signals to control said means for indicating deviation from the landing path.

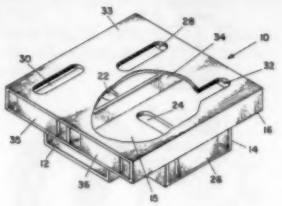
4,429,313

WAVEGUIDE SLOT ANTENNA

Harvey P. Muhs, Jr., 10331 Shirley Ave., Northridge, Calif. 91326, and Charles K. Watson, 653 - 33rd St., Manhatten Beach, Calif. 90266

Filed Nov. 24, 1981, Ser. No. 324,590
Int. Cl.³ H01Q *13/18*
U.S. Cl. 343—771 **6 Claims**

1. A two layer waveguide coupling mechanism having a common wall between the layers and a radiating aperture, the first layer comprising an input waveguide, a feed waveguide whose structure does not extend past the boundary of the radiating aperture, a short circuit at either end of the feed waveguide, coupling slots in the common wall between the layers, the second layer comprising two adjacent radiating



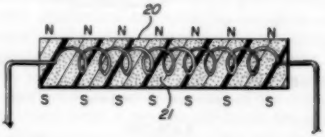
waveguide cavities, a short circuit at either end of each cavity, and radiating slots in the radiating aperture.

4,429,314

MAGNETOSTATIC ELECTRICAL DEVICES

Eugene A. Albright, 1742 W. Rose, Phoenix, Ariz. 85015

Continuation-in-part of Ser. No. 739,429, Nov. 8, 1976, abandoned. This application May 8, 1978, Ser. No. 903,700
Int. Cl.³ H01Q *7/08*
U.S. Cl. 343—788 **8 Claims**



1. An antenna including in combination:

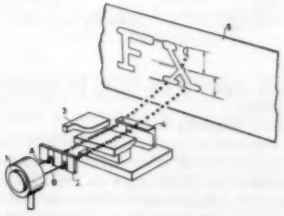
an elongated electrical conductor embedded in permanently magnetized magnetically hard dielectric material.

4,429,315

MULTI-NOZZLE INK JET PRINTER

Masayoshi Tamai, and Tetsuo Iyoda, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Mar. 23, 1982, Ser. No. 361,026
Claims priority, application Japan, Mar. 24, 1981, 56-41693; Oct. 4, 1981, 56-162766
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **6 Claims**



1. An analog deflection type ink jet printer, comprising;

a printer head having a plurality of printing nozzles, said nozzles being horizontally aligned and spaced from one another by a predetermined distance, said distance being equal to an integer multiple of a distance between adjacent bits of a character to be printed, said nozzles operating

simultaneously whereby a plurality of printed bits are simultaneously produced to print said character.

4,429,316

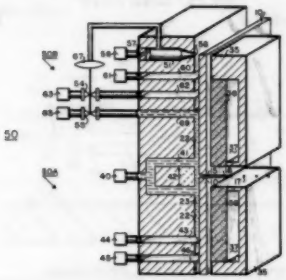
ORIFICE BAND INK JET PRINTER WITH INK CONFINED BY A COUNTERPRESSURE OF AIR

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

Filed Mar. 1, 1982, Ser. No. 353,640

Int. Cl.³ G01D *15/18, 9/00*

U.S. Cl. 346—75 **11 Claims**



1. Apparatus for confining a liquid within a gap, said liquid being under a pressure substantially different from atmospheric, comprising:

means for constraining a first surface which is movable with respect to a second surface to maintain a gap therebetween,

a source of a liquid under pressure communicating with the gap,

a source of a gas and means for regulating the gas at substantially the pressure of the liquid, and

an enclosure sufficiently proximate to the movable first surface so that the gas surrounding the gap is maintained at the regulated pressure whereby the pressure differential across the gap is substantially null and the liquid is substantially confined within the gap.

4,429,317

INK EJECTION HEAD

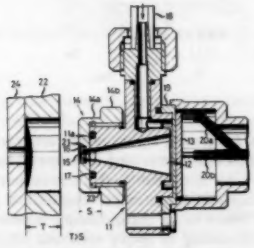
Michio Umezawa, Kawasuki; Osamu Naruse, Hatano; Tatsuya Furukawa; Tamio Ohori, both of Yokohama; Isokazu Furukawa, Sagamihara, and Sadao Kakeno, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 18, 1982, Ser. No. 379,307

Claims priority, application Japan, May 19, 1981, 56-74128; May 23, 1981, 56-77379

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **3 Claims**



1. An ink ejection head comprising a liquid chamber structure, a nozzle holding member and an ink ejection nozzle held in said nozzle holding member, said nozzle holding member being threadably connected to a forward end portion of said liquid chamber structure, wherein the improvement resides in that said nozzle holding member comprises:

a positioning forward end portion having a predetermined outer diameter allowing the positioning forward end portion to be snugly fitted at its outer peripheral surface in a positioning member; and

a rearward portion having an outer diameter greater than the outer diameter of said positioning forward end portion;

and said liquid chamber structure comprises:

a groove formed in a forward end surface of the liquid chamber at which the nozzle holding member is brought into contact at its inner wall surface for receiving therein a sealing member.

4,429,318

THERMAL TRANSFER PRINTER

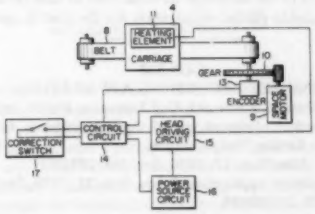
Yoshihiro Kobata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,069

Claims priority, application Japan, Apr. 10, 1981, 56-54567; Apr. 10, 1981, 56-54568; Apr. 10, 1981, 56-54569

Int. Cl.³ G01D *15/10;* **B41J** *29/16*

U.S. Cl. 346—76 PH **8 Claims**



1. A thermal transfer printer, comprising:

a thermal head having heating elements;

means for inputting a correction instruction;

means for supplying power to said heating elements and for driving said heating elements; and

controlling means for controlling power supplied to said heating elements by said driving means to increase an amount of heat generated by said heating elements when the correction instruction for one character is supplied to said controlling means by said correction instruction inputting means.

4,429,319

METHOD AND APPARATUS FOR REGISTERING A TIME-DEPENDENT QUANTITY TO BE MEASURED

Olof B. G. Löfman, Banvägen 21B, and Carl O. Löfman, Högbergavägen 18, both of Lidingö, Sweden

PCT No. PCT/SE80/00178, § 371 Date Feb. 3, 1982, § 102(e) Date Feb. 3, 1982, PCT Pub. No. WO82/00055, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 26, 1980, Ser. No. 354,085

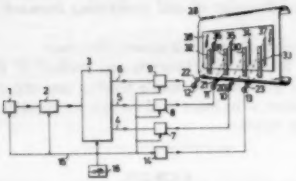
Claims priority, application Sweden, Dec. 17, 1978, 7813329

Int. Cl.³ G01D *9/42*

U.S. Cl. 346—108 **8 Claims**

6. Apparatus for registering a time-dependent quantity to be measured, present in the form of an electric signal, said apparatus comprising conversion means for converting the electric signal to an emission flow which is specifically allotted a measurement value registration, including means for controlling the conversion in response to the measured quantity value so that conversion and registration in conjunction therewith take

place when the measured quantity value is within a predetermined interval; an element for detecting and intergratingly registering the emission in question; and emission control means for causing the emission flow generated by said conversion means to be incident on said detecting and registering element for affecting said element, such that it is given an integrated measurement value registration corresponding to a time function of the measured quantity value, the apparatus



being characterized in that said conversion and emission control means provide the incidence of said emission flow on a zone of said element, said zone consisting of a number of parts in the form of a bar; and filter means arranged selectively to dampen the emission flow portions associated with the respective parts of the zone acted on by the emission for causing the emission flow to be incident with different intensities on respective parts of the emission-affected zone of said element for giving a readable partial registration for the part in question.

4,429,320

INK JET RECORDING APPARATUS

Yoshibumi Hattori, Kawasaki; Koji Terasawa, Fuchu, and Yukio Kasugayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

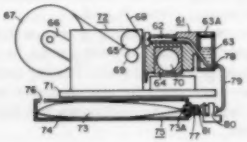
Filed Sep. 17, 1980, Ser. No. 188,053

Claims priority, application Japan, Sep. 21, 1979, 54-120692; Sep. 21, 1979, 54-120693

The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **7 Claims**



1. An ink jet recording apparatus comprising:

a printer unit including a recording head for jetting a recording liquid in response to an electrical signal, a subsidiary container for supplying the recording liquid to said recording head and a reciprocally movable carriage carrying thereon said recording head and said subsidiary container;

supporting means for supporting said printer unit in said recording apparatus;

a flexible supply line having one end connected to said subsidiary container and having the other end connected to a tank connection part fixed to said recording apparatus, said supply line being swingably movable with respect to the reciprocal movement of said carriage to produce a pressure which acts to supply recording liquid to said subsidiary container; and

a flat shaped main container for holding recording liquid is removably connected to the tank connection part, wherein when said main container is in its connected state it is disposed under said supporting means.

4,429,321

LIQUID JET RECORDING DEVICE

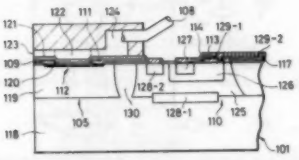
Shigeyuki Matsumoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,894

Claims priority, application Japan, Oct. 23, 1980, 55-149076; Oct. 23, 1980, 55-149077

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **12 Claims**



1. A liquid jet recording device, comprising:

means for defining a plurality of heat actuating chambers each communicating with an associate ejecting orifice for ejecting a liquid in the form of droplets;

a plurality of electrothermal transducers each provided for a separate one of said heat actuating chambers to transfer heat to the liquid filling the associated heat actuating chamber; and

a driving circuit portion including a plurality of function elements for separating signals to drive independently each of said plurality of electrothermal transducers, and for driving said plurality of electrothermal transducers, said plurality of electrothermal transducers and said plurality of function elements being structurally formed in a surface of a substrate.

4,429,322

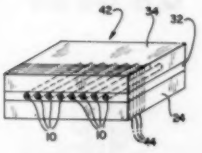
METHOD OF FABRICATING A GLASS NOZZLE ARRAY FOR AN INK JET PRINTING APPARATUS

John L. Dressler, Spring Valley; Biswa N. Ganguly, Beavercreek, both of Ohio, and Bertram VanBreemen, Indianapolis, Ind., assignors to Mead Corporation, Dayton, Ohio

Filed Feb. 16, 1982, Ser. No. 349,135

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**



1. A method of fabricating a glass nozzle array for use in an ink jet printing apparatus comprising the steps of, supporting a plurality of solid core composite glass fibers in spaced parallel arrangement, encapsulating the major longitudinal portions of said plurality of fibers in an encapsulating material selected from the group consisting of epoxy resin and solder glass to form a block of said encapsulating material having said fibers in parallel spaced relationship therein, cutting said block orthogonal to the longitudinal axes of said fibers at a predetermined thickness to form at least one nozzle array, and etching said

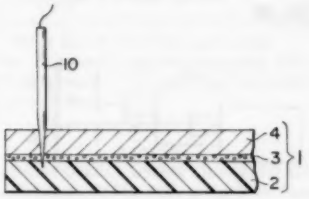
solid core from said fibers to form the orifices in said at least one nozzle array.

4,429,323

METHOD OF ELECTRICALLY CONTACTING RECORDING MEDIUM

Shuichi Ohtsuka, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,596
Claims priority, application Japan, Sep. 25, 1980, 55-133322
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—153.1 **1 Claim**



1. A method of electrically contacting a recording medium comprising pressing an electrode onto a recording medium consisting of a support layer having an electrically insulative surface, an electrically conductive layer consisting of a binder having electrically conductive layer particles dispersed therein, said electrically conductive layer being provided on said insulative surface of said support layer, and a recording layer consisting of a photoconductive substance or a dielectric substance provided on said electrically conductive layer, the force of pressing being such said electrode pierces said recording layer and establishes electrical contact between said electrode and said electrically conductive layer.

4,429,324

ZENER DIODE AND METHOD OF MAKING THE SAME

Aubin U. Wilkens, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,436
Claims priority, application Netherlands, Aug. 18, 1980, 8004651
Int. Cl.³ H01L *29/90, 29/34*
U.S. Cl. 357—13 **9 Claims**

1. A Zener diode comprising a semiconductor body providing a first semiconductor region of a first conductivity type adjoining a surface of said body,

a protective insulating layer on said surface having a window for exposing a portion of said surface,

wherein said first semiconductor region includes a main region below and spaced apart from said surface and being within said window, said main region having an impurity concentration density of the first type,

an epitaxial layer of a second conductivity type provided on and above said surface;

a second region of said second conductivity type extending from said epitaxial layer to said main region and forming a pn junction therebetween,

a sub-region of said second conductivity type surrounding said main region and said second region and extending at least below edges of said window, said sub-region extending substantially further below said surface than said pn junction, and said sub-region maintaining said pn junction for Zener effect far from said edges, and

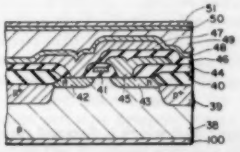
a metal conductor provided over said epitaxial layer.

4,429,325

PHOTOSENSOR

Yukio Takasaki, Hachioji; Tadaaki Hirai, Koganei; Hideaki Yamamoto, Hachioji; Toshihisa Tsukada, Sekimachi, and Yoshiaki Mori, Hamuramachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,780
Claims priority, application Japan, Nov. 14, 1979, 54/146579
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—31 **12 Claims**



1. In a photosensor having at least a metal electrode, at least one means of effecting photoelectric conversion which comprises a layer of photoelectric material and which overlies the metal electrode, and a transparent or partly transparent conductive layer which overlies the means for effecting photoelectric conversion; said photosensor being characterized by comprising means for recombining electrons and holes in the form of a recombination layer of inorganic material arranged between said metal electrode and the photoelectric material layer; said inorganic material comprising at least one member selected from the group consisting of Sb_2S_3, As_2Se_3, As_2S_3, Sb_2Se_3, As_2Te_3, ZnSb, GaP, Pb_2S_3, AlSb, Bi_2S_3 and GaSe.

4,429,326

I²L MEMORY WITH NONVOLATILE STORAGE

Tomoyuki Watanabe, Kodaira; Kenji Kaneko, Hachioji; Tohru Nakamura, Houya; Yutaka Okada, Kokubunji; Takahiro Okabe, Hinodemachi; Minoru Nagata, Kodaira; Yokichi Itoh, Hachioji, and Toru Toyabe, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,388
Claims priority, application Japan, Nov. 29, 1978, 53-146486; Nov. 29, 1978, 53-146487; Feb. 19, 1979, 54-19086[U]
Int. Cl.³ G11C *11/40;* **H03K** *19/091;* **H01L** *27/04, 29/78*
U.S. Cl. 357—43 **17 Claims**

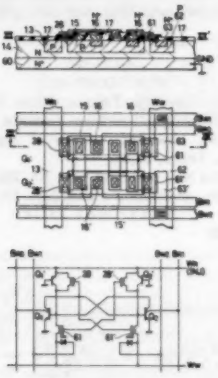
1. A nonvolatile semiconductor memory comprising:

a first I²L (integrated injection logic device) which consists of a first NPN transistor and a first PNP transistor disposed in a surface region of a semiconductor substrate, a second I²L which consists of a second NPN transistor and a second PNP transistor disposed in a surface region of the identical semiconductor substrate, a first collector of said first NPN transistor and a base of said second NPN transistor being connected, a first collector of said second NPN transistor and a base of said first NPN transistor being connected, respective second collectors of said first and second NPN transistors being used as output terminals, and

a first floating gate which is disposed on a base region of said first PNP transistor through an insulating film,

a second floating gate which is disposed on a base region of said second PNP transistor through an insulating film,

a third floating gate which is disposed through an insulating film on a surface region of said semiconductor substrate between the base region of of said first NPN transistor and a control region disposed in opposition to this base region, and



a fourth floating gate which is disposed through an insulating film on a surface region of said semiconductor substrate between the base region of said second NPN transistor and a control region disposed in opposition to this base region, and

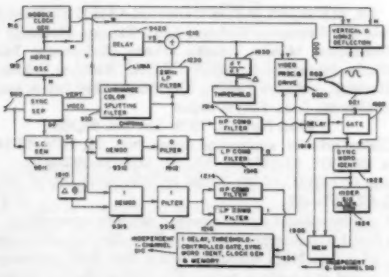
means for injecting charges into said floating gates.

4,429,327

COMPATIBLE TELEVISION SYSTEM WITH INCREASED VERTICAL RESOLUTION

Charles B. Oakley, Princeton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,753
Int. Cl.³ H04N 9/00
U.S. Cl. 358—12 **31 Claims**



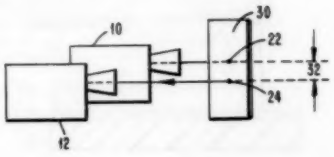
2. A receiver for high-resolution compatible color television signals, comprising: receiving means for receiving the high-resolution compatible color television signals; first separation means coupled to said receiving means for separating luminance and mixed luminance-chrominance-representative portions of said signal; second separation means coupled to said first separating means for separating from said mixed portion of said signal a second luminance-representative signal; and display means coupled to said first and second separation means for producing a high-resolution display in response to said first and second luminance-representative signals, wherein said second luminance-representative signal represents the difference between first and second lines of video and said first luminance-representative signal represents the sum of said first and second lines.

4,429,328

THREE-DIMENSIONAL DISPLAY METHODS USING VERTICALLY ALIGNED POINTS OF ORIGIN

Edwin R. Jones, Jr.; LeConte Cathey, both of Columbia, and A. Porter McLaurin, Chapin, all of S.C., assignors to CJM Associates, Chapin, S.C.

Filed Jul. 16, 1981, Ser. No. 283,902
Int. Cl.³ H04M 9/56
U.S. Cl. 358—88 **20 Claims**



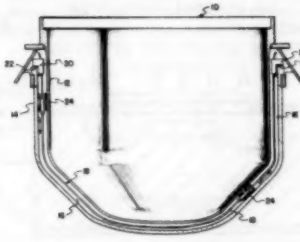
1. A method for producing a three-dimensional illusion of a subject comprising the step of sequentially displaying on a viewing surface images of the subject as viewed alternately first from one point of origin and then, time displaced, from another point of origin at a rate within a range of 4 to 30 changes between said points of origin per second, said points of origin being vertically displaced from one another.

4,429,329

REMOTE VISUAL INSPECTION SYSTEM

Donald D. Clemens, Thousand Oaks; Elmer M. Larson, Jr., Woodland Hills; William T. Morgan, Chatsworth; Oliver P. Steele, III, Canoga Park, and Fred R. Wright, Simi, all of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 9, 1981, Ser. No. 319,529
Int. Cl.³ H04N 7/18
U.S. Cl. 358—100 **8 Claims**



1. A system for the remote visual inspection of a structure including an upwardly extending primary vessel surrounded externally by an upwardly extending guard vessel, said vessels being spaced apart and defining an annulus therebetween, said system comprising;

guide means located about an upper periphery of one of said vessels;

a pair of motor-driven, diametrically opposed trolleys located on said guide means;

means for driving said trolleys during operation of the system and maintaining said trolleys in diametrically opposed positions;

an elongated flexible track member extending downwardly

through said annulus from one of said trolleys and back up the annulus to the other of said trolleys, said track member having one end attached to one of said trolleys and another end attached to the other of said trolleys, said track member further including an elongated engagement means extending from one of said ends to the other of said ends;

at least one carriage located on said track member, said carriage including a drive motor and means for connecting said drive motor to said engagement means for driving said carriage up and down said track member;

a camera located on said carriage and directed towards a portion of at least one of said vessels;

means for illuminating the portion of the vessel at which the camera is directed;

means for providing power to the drive motor and camera and for transmitting signals from the camera; and

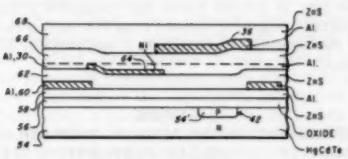
display means for receiving signals transmitted from the camera to permit viewing of the portion of the vessel at which the camera is directed.

4,429,330

INFRARED MATRIX USING TRANSFER GATES

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 18, 1980, Ser. No. 141,498
Int. Cl.³ H04N 5/33, 3/15
U.S. Cl. 358—113 **10 Claims**



1. An infrared imaging system comprising

(a) a lens system for focusing infrared energy emanating from a scene;

(b) a random access imager including a horizontal scan generator, a plurality of detector elements for receiving infrared energy and storing the charges representative of the impinging infrared energy, said detector elements arranged in rows and column, each row of detector elements connected to the horizontal scan generator for sequential operation and an output collector means connected to the columns of detector elements for selectively collecting the charges of the detector elements; said detector elements and output collector means comprising a substrate of semiconductor material of one type conductivity, a first level of electrodes and a first insulating layer sandwiched between the substrate and first level electrodes, said first level of electrodes for defining the detector areas and output collector means, a second layer of insulating material covering the first layer of insulator material and first level of electrodes, a second level of electrodes formed on the second insulator layer for the detector elements, a third insulator layer formed over the second insulator layer and second level electrodes, and third levels of electrodes formed on the third insulator layer, said third level of electrodes forming transfer gates selectively interconnecting the output collector to columns of detector elements, circuit means connected to the output collector means for determining the quantity of charge representative of the infrared energy impinging on the detector elements; and

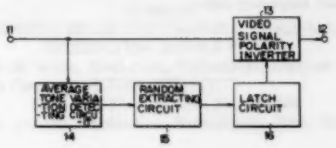
(c) a signal processing means for processing the electrical energy representative of the infrared energy emanating from a scene into video signals.

4,429,331

VIDEO CIPHER PROCESSING SYSTEM

Ryokichi Kanai, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 287,313
Claims priority, application Japan, Jul. 29, 1980, 55-103146
Int. Cl.³ H04N 7/16; H04K 1/04
U.S. Cl. 358—124 **4 Claims**



1. In a video cipher processing system for accepting video signals supplied to the input thereof and for providing a ciphered video signal at the output thereof, said cipher processing system including inverting means for controllably selectively inverting said video input signals provided to said processing systems responsively to control signals applied to said inverting means, said inverting means providing said controllably selectively inverted video signals to the output of said processing systems, and tone detecting means for producing signals responsive to changes in the average tone of said video input signals provided to said processing system, said signals produced by said tone detecting means being used to selectively actuate said inverting means to an inverting or a non-inverting condition, the improvement comprising:

extracting means for selecting at random some of said signals produced by said tone detecting means; and

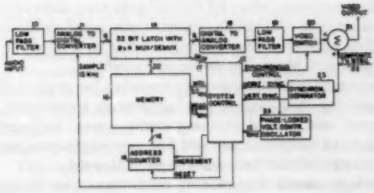
control means responsive to said random selected signals for actuating said inverting means responsively thereto.

4,429,332

TELEVISION COMPRESSED AUDIO

Robert W. Pargee, Jr., San Clemente, Calif., assignor to EECO Incorporated, Santa Ana, Calif.

Filed May 18, 1981, Ser. No. 264,744
Int. Cl.³ H04N 5/783, 5/92
U.S. Cl. 358—143 **18 Claims**



1. The method of communicating audio frequency information having an upper and a lower limit that includes the process steps of;

(a) sampling and digitizing a time sequence of said audio frequency information over the time period of a plurality of video frames,

(b) storing said digitized sequence thereof for compression into the time period of a whole video frame,

(c) recalling the entire digitized sequence from storage at video line scanning frequency, at a rate very many times faster than the audio frequency,

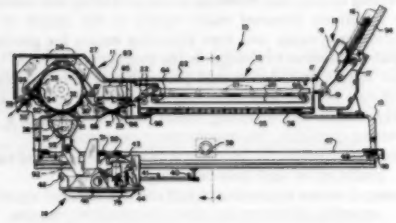
(d) converting the recalled digitized sequence to analog form,

(e) entering that analog information upon the video horizontal lines of one video frame,
(f) transmitting that video frame at video frequencies,
(g) converting the transmitted frame of video frequency audio information from analog to digital form,
(h) storing that converted frame of audio information in addressed digital form, and
(i) uninterruptedly reading out and converting that audio information from digital to analog form at the original audio frequency rate.

4,429,333
DOCUMENT SCANNING SYSTEM

James W. Davis, Richardson; Dale R. DuVall, Keller, and Barry C. Kockler, Lewisville, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,826
Int. Cl.³ H04N 1/10
U.S. Cl. 358—293 10 Claims



1. Document scanning apparatus comprising:
document illumination means including a lamp and a reflector,
an array of photosensors for sensing light generated by said illumination means and reflected from a document to be scanned,
a platen for supporting and exposing bulky original documents held stationary thereupon,
a first exposing station for exposing the front sides of moving sheet-type original documents transported therepast, said first exposing station being located in a common plane with said platen but displaced therefrom,
a second exposing station for exposing the reverse sides of moving sheet-type original documents transported therepast, said second exposing station being displaced from both of said platen and said first exposing station but being located within the common plane thereof,
carriage means for moving said document illumination means and said array of photosensors in a direction parallel to said common plane, said movement moving said document illumination means and said array of photosensors at a uniform scanning speed past said platen and to fixed positions adjacent said first and second exposing stations,
first transport means for transporting original sheet-type documents at a uniform speed past said first exposing station, and
second transport means for receiving original sheet-type documents from said first transport means, presenting the reverse sides of said documents to said second exposing station, and transporting said documents at uniform speed past said second exposing station.

4,429,334
METHOD FOR RECORDING AND REPRODUCING A DIGITAL COLOR VIDEO SIGNAL

Yoshitaka Hashimoto, Chofu; Norihisa Shirota, Atsugi, and Kaichi Yamamoto, Zama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

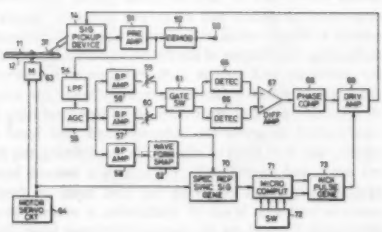
Filed Oct. 7, 1980, Ser. No. 194,830
Claims priority, application Japan, Oct. 12, 1979, 54-132170; Oct. 16, 1979, 54-133313
Int. Cl.³ H04N 5/91
U.S. Cl. 358—310 12 Claims

1. A method of recording a color video signal in a plurality of parallel tracks extending obliquely on a magnetic tape, said method comprising the steps of:
sampling said color video signal at a frequency which is four times the color sub-carrier frequency of the color video signal;
converting the sampled color video signal into digitized form;
alternately separating consecutive ones of the digitized samples into a first odd block and a second even block; and
recording respective groupings of successive digitized samples from said first odd block in alternate ones of said plurality of parallel tracks and respective groupings of successive digitized samples from said second even block in the remaining alternate ones of said plurality of parallel tracks.

4,429,335
ROTARY RECORDING MEDIUM REPRODUCING APPARATUS CAPABLE OF PERFORMING SPECIAL REPRODUCTION

Hiroyuki Sugiyama, Isehara; Masaki Sakurai, Yokohama; Ryuzo Abe, Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 24, 1981, Ser. No. 286,667
Claims priority, application Japan, Jul. 28, 1980, 55-103271
Int. Cl.³ H04N 5/76
U.S. Cl. 358—342 5 Claims



1. A reproducing apparatus for performing a special reproduction of recorded information signals picked up from a rotary recording medium on which the information signals are recorded in spiral track turns or in concentric tracks by use of a reproducing stylus, said rotary recording medium having a reference signal recorded for each track turn at positions which are aligned along a radial direction thereof and at least one vertical synchronizing signal for each track turn, said reproducing stylus being forcibly moved to change the reproducing track responsive to a generation of an external control signal, said reproducing apparatus comprising:

detector means for generating a rotation detection signal having a frequency which is proportional to a rotational speed of said rotary recording medium;

special reproduction synchronizing signal generator means for generating a special reproduction synchronizing signal, said special reproduction synchronizing signal generator means comprising a voltage controlled oscillator having an output oscillation frequency controlled by an output signal frequency of said detector means, and means for frequency-dividing the output of said voltage controlled oscillator under control of the reference signal and for generating the special reproduction synchronizing signal in synchronism with the reference signal, said generated special reproduction synchronizing signal being a pulse series having a specific positional relationship with respect to the recorded position of the reference signal for one track turn of the rotary recording medium and having a frequency which is higher than the frequency of the vertical synchronizing signal;

external control signal generator means for generating an external control signal responsive to a signal obtained by variably controlling the frequency of said special reproduction synchronizing signal; and

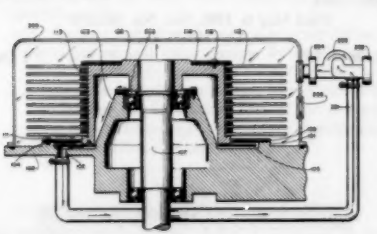
manual switch means for varying the frequency of said special reproduction synchronizing signal via said external control signal generator means responsive to an output code signal respectively corresponding to positions of said manual switch means when released, said manual switch means being positioned at a predetermined neutral position to produce said external control signal once every one rotation of said rotary recording medium to repetitively reproduce the same track, said manual switch means varying the frequency of said external control signal to vary at predetermined steps a speed of picture motion produced by the reproduced information signal corresponding to positions of said manual switch means other than said predetermined neutral position.

4,429,336

DISC DRIVE DYNAMIC SEAL

Normand A. Berube, North Andover; Pavel Otavsky, Southboro; Sigmund Hinlein, Sudbury, and Thomas Wiseley, Acton, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Sep. 28, 1981, Ser. No. 306,105
Int. Cl.³ G11B *23/04, 25/04*
U.S. Cl. 360—97 **4 Claims**



1. Memory apparatus comprising:

a base having an aperture formed therein;

a housing mounted on said base such that an enclosed volume is defined;

means for providing clean air into said enclosed volume, said air providing means including blower means;

at least one magnetic disc internal to said enclosed volume;

hub means internal to said enclosed volume for holding said at least one magnetic disc;

rotation means rotatably mounted through said base for spinning said hub means;

bearing means for rotatably connecting said base and said rotation means;

means for inhibiting migration within said enclosed volume of contaminants from said bearing means to the vicinity of said at least one disc; and

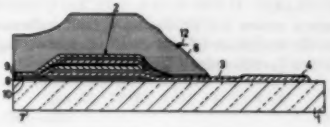
means for applying suction to said aperture, whereby removal of contaminants from said enclosed volume is enhanced.

4,429,337

MAGNETIC HEAD UNIT HAVING THERMALLY DISSIPATING COVER PLATE

Johannes de Wilde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,820
Claims priority, application Netherlands, Nov. 28, 1979, 7908611
Int. Cl.³ G11B *5/20*
U.S. Cl. 360—123 **18 Claims**



2. A magnetic head unit, comprising:

a housing;

a non-electrically conductive common substrate provided in said housing;

a plurality of magnetic transducing elements arranged in a row on said substrate, each of said transducing elements comprising a transmission element and at least one discrete magnetic layer cooperating with said transmission element to define a transducing element, and

a cover plate of non-magnetic material, said transducing elements being disposed between said substrate and said cover plate;

characterized in that said cover plate is formed of a semiconductor material and is arranged in a good thermally-conducting relationship with said transducing elements and with said housing.

4,429,338

EARTH CONTACT MONITORING DEVICE FOR A POLYPHASE THREE-PHASE FILTER CIRCUIT

Michael Becker, Uttenreuth; Alfons Fendt, Erlangen; Dusan Povh, Nuremberg; Klaus Renz, Fürth; Gerhard Schuch, Erlangen, and Hermann Waldmann, Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 164,571, Jun. 30, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,187
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2928024
Int. Cl.³ H02H *3/16*
U.S. Cl. 361—42 **5 Claims**

1. A monitoring system for determining earth contact for at least one phase of a polyphase transmission network, the monitoring system further comprising:

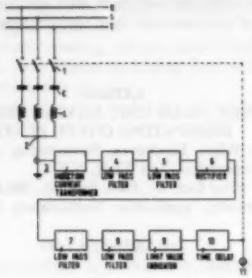
a plurality of filter means for connecting respectively associated ones of the phases in the polyphase transmission network to a neutral node which is connected to earth via a direct connection,

means for producing a first signal responsive to current flowing through said direct connection between said neutral node and earth,

means for producing a second signal indicative of the ampli-

tude of the fundamental frequency component of said first signal,

means for producing a direct current voltage signal responsive to the amplitude of said second signal, and



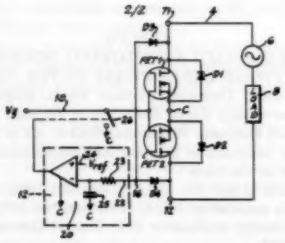
comparison means for producing a fault indicator signal when the amplitude of said direct current voltage signal exceeds a predetermined level.

4,429,339

AC TRANSISTOR SWITCH WITH OVERCURRENT PROTECTION

James R. Jaeschke, Waukesha, and Walter L. Rutchik, Wauwatosa, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,722
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—93 **27 Claims**



14. An AC transistor switch with overcurrent protection comprising:

a pair of FETs (field effect transistors) connected in anti-series between a pair of main terminals, said FETs having an ON state responsive to gate drive to enable conduction between said main terminals, said FETs having an OFF state in the absence of said gate drive to block current flow between said main terminals, each said FET having an inherent diode in anti-parallel therewith; and

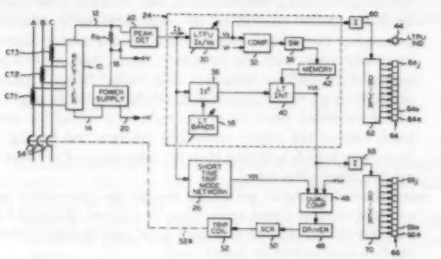
comparator means for sensing current flow through said inherent diodes and responsive to given threshold overload current to remove gate drive and turn off said FETs.

4,429,340

BARGRAPH DISPLAYS FOR STATIC TRIP CIRCUIT BREAKERS

Edward K. Howell, Simsbury, Conn., assignor to General Electric Co., New York, N.Y.

Continuation of Ser. No. 247,433, Mar. 25, 1981, abandoned.
This application Jan. 17, 1983, Ser. No. 458,686
Int. Cl.³ H02H *3/093*
U.S. Cl. 361—96 **3 Claims**



1. A static trip circuit breaker accessory including, in combination:

a display continuously displaying phase current magnitude relative to a pre-selected adjustable pickup current level whereby a static trip unit initiates a circuit breaker trip function upon the expiration of an appropriate delay interval in response to phase current magnitudes exceeding the pre-selected pickup current level,

a continuous display driver electrically activating said display under the control of said trip unit;

an indicator activated by said trip unit for indicating that the phase current magnitude exceeds the pre-selected pickup level;

an additional display continuously displaying the elapsed time of the delay interval relative to the delay interval duration; and

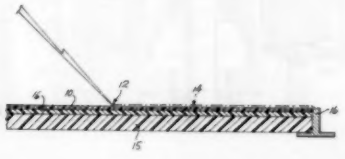
an additional driver electrically activating said additional display under the control of said trip unit.

4,429,341

LIGHTNING PROTECTION FOR EXTERNAL SURFACE COMPOSITE MATERIAL OF AN AIRCRAFT

Charles H. King, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 6, 1981, Ser. No. 260,871
Int. Cl.³ H02H *3/22*
U.S. Cl. 361—117 **1 Claim**



1. A lightning diverter structure for an aircraft external surface portion of composite material comprising in combination therewith:

a layer of dielectric material having a lower surface adapted to be applied to the aircraft external surface portion of composite material, said layer of dielectric material having an upper surface comprising a major surface area opposite said lower surface;

a binder on said upper surface containing a conductive metal power of finely divided metallic particles deposited in said binder and uniformly extending over said upper surface;

an aircraft structural component comprising a metal support member for supporting said aircraft external surface portion of composite material and providing reference potential; and

said layer of dielectric material having a thickness of between 0.01 inches and 0.1 inches, said thickness of said layer of dielectric material being greater with increasing distance of said dielectric layer from said metal support member providing said reference potential.

4,429,342

IMPACT PRINTING DEVICE WITH AN IMPROVED PRINT HAMMER

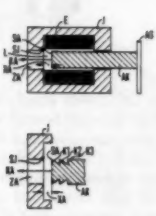
Ulrich Heider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,455

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116402; Dec. 8, 1981, 3148503

Int. Cl.³ B41J 9/00; H01H 47/00

U.S. Cl. 361—152 **15 Claims**



1. A plunger-type magnet system for actuating a print hammer in a printing device comprising:

a stationary yoke consisting of material of high magnetic permeability and having a central axial recess therein with an interior rim having a sharply-defined annular edge;

an armature which is said print hammer disposed in said central recess of said yoke for axial movement therein and having a drive portion comprised of material of high magnetic permeability;

an excitation coil wound around said armature for generating a magnetic field for axially moving said armature toward said interior rim during a printing stroke; and

a circuit means for selectively supplying current to said excitation coil,

said armature having a plurality of sharply-defined annular edges on said drive portion formed by an annular channel in said drive portion for cooperating with said interior rim as said drive portion axially moves through said interior rim for causing lines of force of said magnetic field to converge at said edges thereby increasing the kinetic energy of said armature.

4,429,343

HUMIDITY SENSING ELEMENT

Paul J. Freud, Furlong, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 3, 1981, Ser. No. 326,794

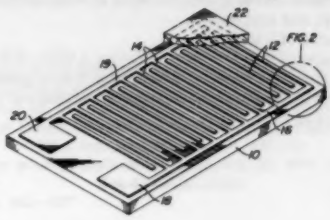
Int. Cl.³ H01G 5/20

U.S. Cl. 361—286 **4 Claims**

1. A fast, precise capacitance humidity sensing element comprising:

a planar non-conducting substrate;

two separate closely spaced interdigitated thin metal film electrodes deposited on said substrate with fingers having a certain period; and a thin water absorbing coating covering said interdigitated electrodes, said coating being of thickness substantially equal to or greater than the period of the fingers of said interdigitated electrodes to place the surface of the coating far enough from the surface of the



fingers so that the influence of contaminants on the coating surface is negligible.

4,429,344

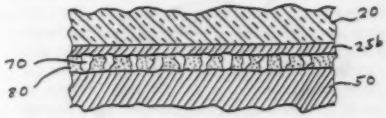
CONDUCTIVE FOILS FOR SOLID DIELECTRIC CAPACITOR

Boyce D. Whitman, Six Mile, and Robert F. Bates, Liberty, both of S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed May 14, 1982, Ser. No. 378,320

Int. Cl.³ H01G 1/01, 13/00, 4/08

U.S. Cl. 361—303 **15 Claims**



6. In a capacitor having at least one solid dielectric layer, a conductive layer formed on either side of said dielectric acting as plates for said capacitor, and foil-type electrodes associated with each of said capacitor plates, the improvement comprising:

a conductive particulate material applied between each said foil electrode and each said capacitor plate, whereby electrical contact is improved therebetween.

4,429,345

ELECTRICAL DEVICES IMPREGNATED WITH SILICONE FLUIDS

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 18, 1981, Ser. No. 322,355

Int. Cl.³ H01G 4/22, 4/04; H05K 5/06

U.S. Cl. 361—315 **31 Claims**

1. An electrical device impregnated with a dielectric fluid that is substantially free from water which is a reaction product of a cyclic siloxane having the general formula $(A'_yA_zSiO)_q$ wherein,

A' is selected from the group consisting of substituted and unsubstituted unsaturated hydrocarbon radicals,

A is selected from the group consisting of hydrogen, substituted saturated hydrocarbon radicals, and unsubstituted saturated hydrocarbon radicals,

y has a value of 0 to 2,

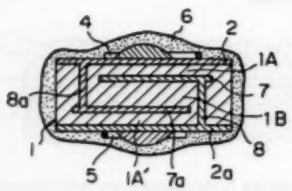
z has a value of 0 to 2, with y+z, the degree of substitution, having an average value of 2, and q has a value of 3 to 12 and a silane,

said silane having the general formula $R_aR'_bSi(OX)_{4-a-b}$ wherein,

R is selected from the group consisting of hydrogen, substituted saturated hydrocarbon radicals, and unsubstituted saturated hydrocarbon radicals,

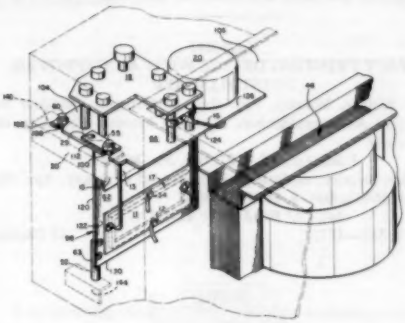
R' is selected from the group consisting of substituted and unsubstituted unsaturated hydrocarbon radicals,
X is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, and acyl radicals,
a has a value of 0 to 3,
b has a value of 0 to 3, with a+b having a value of 0 to 3,
said dielectric fluid having an unsaturation level of greater than ten percent by weight and a viscosity of less than one hundred centistokes at 25° C.

4,429,346
CERAMIC CAPACITOR
Atsushi Sato, and Hiroshi Tsuyuki, both of Nikaho, Japan, assignors to TDK Electronics, Tokyo, Japan
Division of Ser. No. 171,669, Jul. 24, 1980, Pat. No. 4,356,530. This application Mar. 4, 1982, Ser. No. 354,647
Claims priority, application Japan, Dec. 15, 1979, 54-163316; Jan. 25, 1980, 55-8048
Int. Cl.³ H01G 4/10
U.S. Cl. 361—321 **3 Claims**



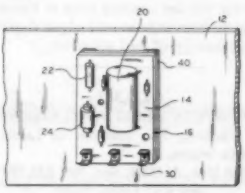
1. A ceramic capacitor comprising;
(a) a dielectric plate (1) having a first thin plate (1A), a second thick plate (1B) and a third thin plate (1A') laminated with one another in that sequence, each of said first and third thin plates (1A, 1A') being too thin to support the capacitor itself, and the second thick plate (1B) being thick enough to support the capacitor, the material of all the plate (1A, IB and 1A') being the same as one another,
(b) a first outer electrode (2) attached on the major portion of the outer surface of said first thin plate (1A),
(c) a second inner electrode (7) extending between said thin plate (1A) and said thick plate (1B) so that the first and the second electrodes sandwich the thin plate (1A) to provide a first capacitance,
(d) a third inner electrode (7*a*) extending between said thick plate (1B) and said third thin plate (1A'),
(e) a fourth outer electrode (2*a*) attached on the major portion of the outer surface of said third thin plate (1A') so that the third and the fourth electrodes sandwich the thin plate (1A') to provide a second capacitance,
(f) a first through hole conductor (8) penetrating the thick plate (1B) and the thin plate (1A') in the thickness direction of the dielectric plate and connecting electrically the inner electrode (7) and the outer electrode (2*a*),
(g) a second through hole conductor (8*a*) penetrating the thick plate (1B) and the thin plate (1A) in the thickness direction of the dielectric plate and connecting electrically the inner electrode (7*a*) and the outer electrode (2),
(h) said inner electrodes (7, 7*a*) having windows for penetrating the through hole conductors (8, 8*a*) without contacting to the through hole conductors, and
(i) a pair of lead lines (4, 5) soldered to the outer electrodes (2,2*a*), respectively.

4,429,347
EASILY REMOVABLE SUPPORT ASSEMBLY FOR A HIGH VOLTAGE DC POWER SUPPLY
James P. Seitz, Burlington, N.J., assignor to NWL Transformers, Bordentown, N.J.
Filed May 11, 1981, Ser. No. 262,134
Int. Cl.³ H05K 7/20
U.S. Cl. 361—379 **13 Claims**



1. A high voltage DC power supply having a transformer and other electrical components housed within a tank containing fluid having at least one cover and one sidewall with the transformer rigidly secured to the tank comprising
(a) a compact easily removable support assembly supported independently of said cover and said transformer and carrying at least a major portion of said other electrical components, said support assembly including an "L" shaped insulated support frame, and
(b) support structure means removably securing and suspending at least one leg of the "L" of said support assembly solely from said side wall so as to extend the support assembly interiorly within said tank independent and free of attachment to other portions of the tank and power supply whereby the support assembly by itself is removable while leaving the transformer and fluid in place in said tank.

4,429,348
PRINTED CIRCUIT MOUNTING APPARATUS ESPECIALLY FOR USE IN LUMINAIRES
John R. Dean, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jan. 18, 1982, Ser. No. 340,512
Int. Cl.³ H05K 1/18
U.S. Cl. 361—399 **4 Claims**



1. Apparatus for demountably fastening a printed circuit board to the surface of an electrically conductive interior metal wall of an outdoor luminaire in which said board contains a control circuit comprising discrete electrical components on one face thereof and electrically conductive circuits interconnecting the components on the opposite face thereof, said apparatus including a first and a second complementary mating hook and pile fastening strip of electrically insulating material

such as nylon, at least one of said strips having a face of sufficient area to cover and electrically insulate the conductive circuits on the board, means affixing the first of said strips to the opposite face of the board to position the mating face of the strip away from the board, means affixing the second strip to the surface with the mating face of the second strip positioned away from the surface whereby to interpose a layer of electrically insulating material between the board and said surface when the mating faces of the strips are mated together.

4,429,349

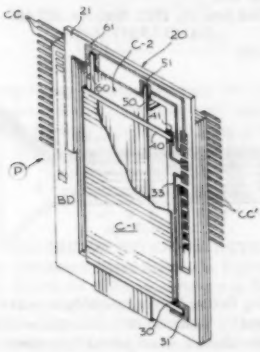
COIL CONNECTOR

Clyde L. Zachry, San Marcos, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 192,305, Sep. 30, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 397,312

Int. Cl.³ H05K *1/14*

U.S. Cl. 361—414 **9 Claims**



1. Improved attachment-interconnect means for use with bubble memory means comprising an E-shaped or U-shaped bubble substrate for mounting one or more bubble memory devices, together with associated printed circuit conductors and electrical coil means including a plurality of coil leads, this interconnect means comprising:

at least two interal orthogonal interconnect-strip means, with one thereof being attached rigidifyingly across two or more cantilevered arms of the bubble substrate; and

a plurality of printed circuit connector segments, one attached to each said coil lead, these segments being disposed along two or more of said interconnect-strip means.

4,429,350

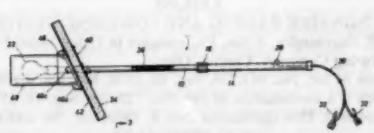
UNDERWATER ILLUMINATION DEVICE

Gaylord N. Guthrie, 2812 Rose, Pasadena, Tex. 77503

Filed Sep. 15, 1982, Ser. No. 418,230

Int. Cl.³ B25B *23/18*

U.S. Cl. 362—120 **13 Claims**



1. Subsurface lighting apparatus comprising:

illumination means;

an elongate handle attached to and extending from said illumination means, said handle comprising means for selectively adjusting the length of said handle; and

flotation means comprising a buoyant body having inboard and outboard surfaces, said buoyant body being connected to said handle inboard of said illumination means and at a non-perpendicular angle with respect to said handle.

4,429,351

ELECTRIC LAMP WITH A SINGLE DEVICE FOR FOCUS-CONTROL AND SWITCH-CONTROL

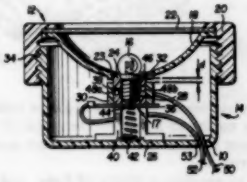
Paul Petzl, St. Vincent de Mercuze, and Pierre Petzl, Crolles, both of France, assignors to Etablissements Petzel, France

Filed Sep. 30, 1982, Ser. No. 428,659

Claims priority, application France, Sep. 28, 1981, 81 18367

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—187 **7 Claims**



1. An electric lighting lamp comprising:

a first casing subassembly comprising a rotatably adjustable nut collar, a parabolic reflector joined to said rotatably adjustable nut collar and a transparent screen contained in said nut collar, said reflector defining a cylindrical opening arranged in the central portion thereof surrounded by an annular flange to allow passage of an electrical bulb therethrough upon rotation of said nut collar, the inside surface of said collar being threaded to form a nut;

a second casing subassembly including a cylindrical container with an external thread on one end comprising a fixed tubular sleeve member having notches therein secured to said container for holding said electrical bulb, said second casing cooperating with said first casing subassembly so as to cause an axial translation displacement when said nut collar is rotated relative to said container, said first and second subassemblies being moved toward and away from one another during said displacement;

switch means for connecting said bulb to an electric current source comprising a semi-stationary contact bridge extending transversely within an orifice of said sleeve member, and having a face cooperating in the closed position of said switch means with a connecting terminal for said bulb;

elastic means for urging said semi-stationary contact bridge against said connecting terminal when the reflector of said first casing subassembly is moved between first and second axially translated positions of said displacement, defining a predetermined course for adjusting the light focus of said lighting lamp;

and control means cooperating with said contact bridge which is automatically separated from said connecting terminal against the action of said elastic means, thereby opening the switch during further translation of said reflector toward an end position disposed outside said first and second positions of the adjustable light focus course.

4,429,352

FLASHLIGHT

James P. Griffin, 1216 Ash St., St. Charles, Ill. 60174

Filed Mar. 28, 1983, Ser. No. 479,853

Int. Cl.³ F21L *7/00*

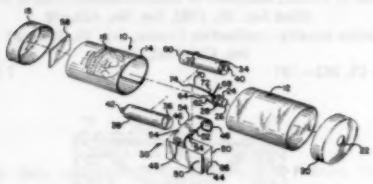
U.S. Cl. 362—189 **7 Claims**

1. A disposable light source comprising:

a first and a second battery means to provide a source of electrical power,

a resilient member positioned between said first and second battery means,

a conductive strap positioned about said battery means and said resilient member to press said battery means against said resilient member and create stresses therebetween sufficient to insure electrical continuity between said strap and an uninsulated outer casing of said second battery means with insulation means positioned between said strap and said first battery means,



a conductive plate means joining a negative terminal of said first battery means to a positive terminal of said second battery means to connect said first and second battery means in series, and

a bulb means to provide a source of light, said bulb means having a first lead wire connected to a positive terminal of said first battery means and a second free lead wire located proximate said strap for selective engagement therewith,

wherein engagement of said bulb free lead wire with said strap connects said first and second battery means to said bulb means to energize said bulb means and produce light.

4,429,353

SCANNING ILLUMINATING DEVICE

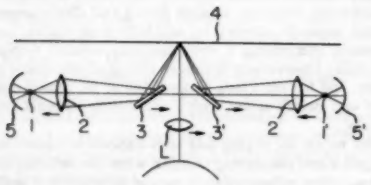
Mitsuhiro Tokuhara, Chigasaki; Yu Yamada, Tokyo; Yukio Takemura, Kawasaki; Takeshi Kuwayama, Yokohama, and Susumu Seto, Odawara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 280,095

Claims priority, application Japan, Jul. 11, 1980, 55-94777

Int. Cl.³ G03B *27/54*

U.S. Cl. 362—232 **4 Claims**



1. A scanning illuminating device in an image forming apparatus of the slit exposure scanning type, comprising:

a first fixed light source positioned in the vicinity of one end portion of an original surface;

a first imaging element movable in a predetermined direction with respect to said first light source while imaging said first light source upon the original surface in a slit-like form;

a first mirror movable with said first imaging element to correct the length of the light path so as to maintain an imaging relation so that reflected light scans the original surface;

a second fixed light source positioned in the vicinity of the other end portion of the original surface;

a second imaging element movable in a predetermined direction with respect to said second light source while imaging said second light source upon the original surface in a slit-like form; and

a second mirror movable with said second imaging element to correct the length of the light path so as to maintain an imaging relation so that reflected light scans the original surface while overlapping the area irradiated by said first mirror;

whereby the illumination distribution on the original surface in the scanning direction is formed into a distribution compensating for irregularity of quantity of light of the optical system.

4,429,354

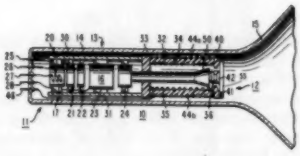
LIGHTING FIXTURE LOUVER

Willard R. Garnett, Tupelo, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 427,657

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—342 **5 Claims**



1. In a lighting fixture louver assembly in which a plurality of louvers, generally V-shaped in end elevation with side walls forming a narrow lower portion joined by a closed bottom, are connected to side or end rails, the improvement comprising an extension of a lower portion of said side walls and bottom at an end of said louvers projecting beyond a contiguous upper portion of said end, and cut wings integral with said lower portion, said rails having in a side wall slots extending upwardly from immediately adjacent the bottom edge of said wall and of a size to receive said extension, said extension projecting therethrough, said wings being spread laterally along lines substantially parallel to the long axis of said louver behind and a cut surface of each of said wings engaging the back surface of said side wall, said closed bottom of said louver projecting uninterruptedly through said side wall of said rail.

4,429,355

LUMINAIRE RAISING AND LOWERING SYSTEM

John S. Garchinsky, Aldan, Pa., assignor to Union Metal Manufacturing Company, Canton, Ohio

Division of Ser. No. 943,726, Sep. 18, 1978, Pat. No. 4,228,488, which is a continuation of Ser. No. 723,099, Sep. 14, 1976, abandoned. This application Oct. 8, 1980, Ser. No. 195,020

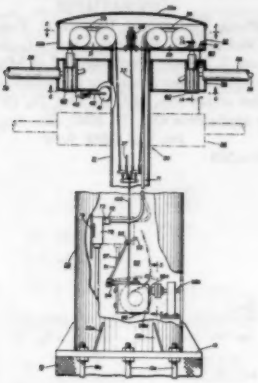
Int. Cl.³ F21V *21/36*

U.S. Cl. 362—403 **14 Claims**

1. In a system for raising and lowering luminaires or the like to and from the top of a pole in which a luminaire carrier is suspended by cable means from a support means toward the top of said pole, the combination comprising:

(a) a plurality of upwardly-extending rod-like movable arms

borne by said carrier and having their upper terminal portions angled relative to their lower portions, and



(b) a corresponding plurality of means associated with said support means for engaging said arms respectively when said carrier has been raised to a position adjacent said top.

4,429,356

TRANSISTOR INVERTER DEVICE

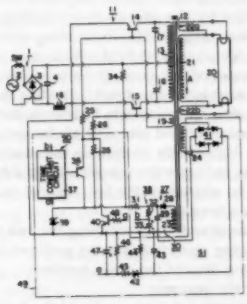
Kenichi Inui, Yokohama; Hisao Kobayashi, Fujisawa, and Tadao Funabashi, Atsugi, all of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,816

Claims priority, application Japan, Dec. 26, 1980, 55-186081

Int. Cl.³ H02H *7/122*

U.S. Cl. 363—56 **6 Claims**



1. A transistor inverter device including a transistor inverter circuit having an output transformer, and a circuit for detecting the output abnormality of said transistor inverter circuit to control the operation of said transistor inverter circuit, wherein said transistor inverter device includes a base driving circuit for supplying a driving output obtained by rectifying a part of high frequency output of said transistor inverter circuit to a base of at least one switching transistor; a control circuit having means for detecting the output abnormal state of said transistor inverter circuit and separating means for bringing the driving circuit inoperative with respect to the transistor inverter circuit at the time the abnormal state is detected; and an auxiliary power source charged by output of said driving circuit to supply operating voltage to the control circuit.

4,429,357

METHOD FOR PLACING INTO OPERATION A SERIES CONNECTED GROUP OF STATIC POWER CONVERTERS OF A HIGH VOLTAGE DIRECT-CURRENT TRANSMISSION INSTALLATION

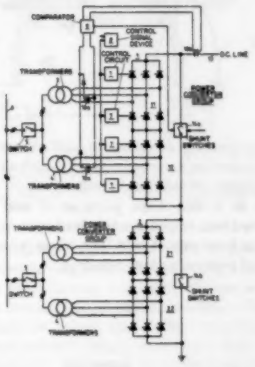
Michael Häusler, Hirschberg, and Karl-Werner Kanngiesser, Viernheim, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 1, 1981, Ser. No. 269,371

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023698

Int. Cl.³ H02J *3/36;* H02H *7/00*

U.S. Cl. 363—68 **4 Claims**



1. In a method of placing into operation one power converter group operating in a rectifying mode of a number of power converter groups which with respect to a direct-current are connected in series and with respect to an alternating-current are connected in parallel of a high voltage direct-current power transmission installation, wherein a bypass switch is connected in parallel with each power converter group, the improvement which comprises the steps of:

setting control pulses of one power converter group of the power converter groups which is to be placed into operation at a range of approximately 100 to 115 electrical degrees;

thereafter delivering an opening command to the bypass switch of such one power converter group in order to open said bypass switch;

said control pulses, after accomplishing opening of said bypass switch, being shifted according to a predeterminable linear ramp function in a rectifying range; and

thereafter setting the control pulses to be load-current dependent.

4,429,358

FLYBACK TRANSFORMER

Toshimi Miyagi, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 28, 1982, Ser. No. 343,395

Claims priority, application Japan, Feb. 12, 1981, 56-19759

Int. Cl.³ H01F *15/10;* H02M *7/06*

U.S. Cl. 363—68 **6 Claims**

1. A flyback transformer comprising:

a core;

a primary winding wound through a primary winding bobbin onto said core;

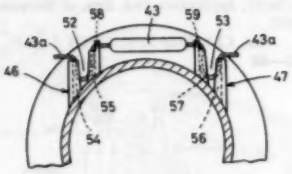
a secondary winding wound on a secondary winding bobbin and magnetically coupled to said primary winding; and

a diode connected to said secondary winding, said diode having opposite lead wires each being bent into a U- or V-like shape;

said transformer being provided at a peripheral surface of

said secondary winding bobbin with at least a pair of supports for said diode, said supports being provided with jig insertion grooves extending at an angle other than 90° to the axis of said secondary winding bobbin and defining inner surface portions of said supports;

a lead wire insertion groove being formed in at least one said inner surface portion of each said support and extending in



the projecting direction of said support, each said lead wire insertion groove having a width slightly smaller than a diameter of said diode lead wires;

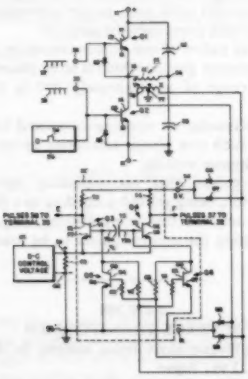
the U- or V-like shape portions of said lead wires being inserted into respective said lead wire insertion grooves so that at least one of said lead wires is connected to terminals of said secondary winding.

4,429,359

INVERTER CIRCUIT WITH SYMMETRY CONTROL

Thomas E. Anderson, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,291
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 **6 Claims**



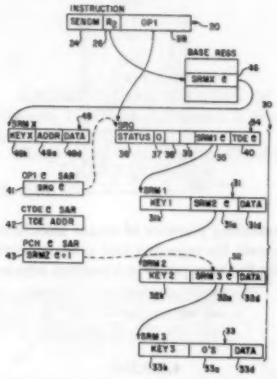
1. An inverter circuit comprising switching means for applying a symmetrical waveform alternating voltage to a load, said circuit being subject to inadvertent premature switching, wherein the improvement comprises a control circuit means connected to said load for deriving an alternating control voltage therefrom and connected to said switching means for controlling said switching means to switch and reverse polarity of said load voltage to limit the amplitude of said load voltage to a predetermined maximum voltage and to maintain time symmetry of said load voltage, so as to maintain said alternating load voltage waveform symmetrical upon occurrence of said inadvertent premature switching.

4,429,360

PROCESS AND APPARATUS FOR INTERRUPTING AND RESTARTING SEQUENTIAL LIST-PROCESSING OPERATIONS

Roy L. Hoffman, Pine Island; William G. Kempke, Rochester; John W. McCullough, Rochester; Frank G. Soltis, Rochester, and Richard T. Turner, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 953,982, Oct. 23, 1978, abandoned.
This application Oct. 29, 1980, Ser. No. 201,880
Int. Cl.³ G06F 9/06
U.S. Cl. 364—200 **9 Claims**



1. A process executed in a multitasking digital computer system for interrupting and restarting a sequential list-processing operation, the list-processing operation being performed under a task identified by a descriptor and including the steps of accessing in a sequential order a plurality of elements located in a storage of said digital computer system, each element including an address field which encodes the address of the next element to be accessed, the plurality of elements in the order specified by the address fields defining a chain of elements, the beginning of the chain being defined by a header which includes an address field which encodes the address of the first element of the chain; the process cmprising:

(a) testing for an interrupt signal indicating that the sequential list procession operation is to be interrupted prior to accessing an element of said plurality of elements;

(b) setting a busy-bit bit position in the header of the chain if said testing indicates the presence of an interrupt signal;

(c) storing the address of the last element accessed after said busy bit has been set;

(d) storing the descriptor identifying the task under which the list-processing operation is being performed in an interrupted-operation field of the chain header;

(e) handling the interrupt;

(f) testing the state of the busy bit in the header of the chain before allowing access to said elements by a list processing operation to be performed under an active task after the handling of the interrupt;

(g) comparing the descriptor of said active task to the descriptor stored in the interrupted-operation field of the header of the chain;

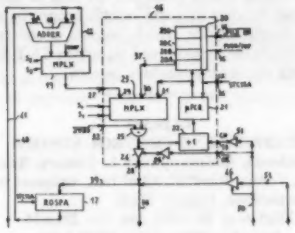
(h) resetting the busy bit to allow access to said elements for restarting the list-processing operation under the active task at the element located at the address stored in the interrupt-address field of the header if the descriptor of the active task compares with the descriptor stored in the interrupted-operation field; and

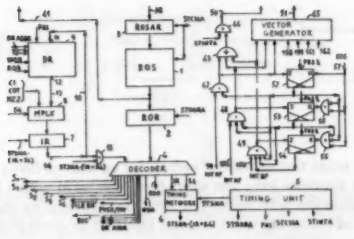
(i) signaling an exception to the active task if the descriptor of the active task does not compare with the descriptor stored in the interrupted operation field.

4,429,361
SEQUENCER MEANS FOR MICROPROGRAMMED CONTROL UNIT

Tiziano Maccianti, Pregnana Milanese, and Vittorio Zanchi, Milan, both of Italy, assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 8, 1981, Ser. No. 271,167
Claims priority, application Italy, Jun. 11, 1980, 22732 A/80
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **3 Claims**





1. In the microprogrammed control unit of a data processing system comprising an addressable control memory, a timing unit for timing the operation of said control unit during subsequent machine cycles, a decoder receiving at its inputs, at each machine cycle, a microinstruction read out from said control memory, said decoder supplying microcommand outputs for controlling said control unit, sequencer means for addressing said control memory comprising:

a first loop for address circulation comprising multiplexing means, a first output node downstream said multiplexing means for outputting addresses from said loop, an incrementer having inputs connected to said output node and outputs, said incrementer being controlled to increment by one unit or to transfer unchanged an address received on its inputs; a first register having its input connected to the outputs of said incrementer, and outputs connected to a first input set of said multiplexing means, an address saving register stack having inputs coupled to the output of said first register and outputs coupled to a second input set of said multiplexing means;

a second loop for address circulation comprising a first set of gates controlled by an interruption signal and having their inputs connected to said first output node, a second output node connected to the outputs of said first set of gates for outputting addresses from said second node to said control memory, a second register having inputs connected to said second node and outputs, a summing network having a first input set connected to the outputs of said second register and a second input set connected to outputs of said control memory, said summing network having outputs connected to a third input set of said multiplexing means, said second loop comprising further said multiplexing means, said first output node in common with said first loop;

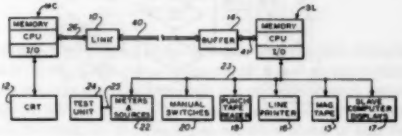
an input channel for interruption addresses connected to said second node; and

a second set of gates enabled by an interruption signal and controlling said input channel.

4,429,362
DATA BUFFER OPERATING IN RESPONSE TO COMPUTER HALT SIGNAL

John J. Costantini, Sommerville, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 18, 1981, Ser. No. 275,005
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 **10 Claims**



1. A buffer for exchanging data between a device and a computer, the former having means for providing a plurality of device signals, the latter having a plurality of lines including a halt line, said halt line being operable to transmit a halt signal when said computer has halted, said buffer comprising:

a plurality of transmitting means, including a halt transmitter, each separately connected to predetermined respective ones of said plurality of lines, each of said plurality of transmitting means being operable to transmit its signal to said device, said halt transmitter being connected to said halt line for transmitting said halt signal to said device; and

a plurality of receiving means connected between said device and given respective ones of said plurality of lines for coupling to them said device signals from said device, said given respective ones of said lines and said predetermined respective ones of said lines having at least one common member, each one of a predetermined set from said plurality of receiving means having a control means for controlling said predetermined set, said control means having a receive terminal commonly connected to said halt line for enabling operation of said predetermined set in response to said halt signal, the presence and absence of said halt signal on said halt line being effective to enable and disable, respectively, said predetermined set from said plurality of receiving means.

4,429,363
METHOD AND APPARATUS FOR MANAGING DATA MOVEMENTS FROM A BACKING STORE TO A CACHING BUFFER STORE

Alan H. Duke; Michael H. Hartung, and Frederick J. Marschner, all of Pima County, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1981, Ser. No. 311,362
Int. Cl.³ G06F 13/00, 3/06
U.S. Cl. 364—200 **13 Claims**

1. The machine-implemented method of operating a data storage hierarchy having a backing store and a caching buffer store with means to store data in said buffer store based upon addressable data storage areas of said backing store, both of said stores having a plurality of addressable data storage areas; including the steps of:

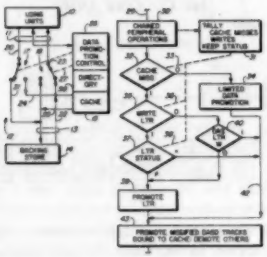
monitoring a plurality of series of requests for accessing said storage hierarchy received from a user connected to the storage hierarchy and setting a status bit for indicating whether or not predetermined writing operations occurred within said series of requests, respec-

tively, each said series of requests having a plurality of access requests for accessing the data storage hierarchy a respective plurality of data storage areas; and

during any of said series of requests which include writing data to said storage hierarchy during any one of said requests in such any series of requests, storing such written data in said backing store;

determining completion of said any series of requests;

upon said determination of said completion of said any series of requests, determining whether or not the contents of that addressable storage area of said buffer store storing a supposed replication of data from said backing store addressable area accessed by the last access request in said any series of requests actually is storing an exact replication of data stored in said backing store addressable storage area addressed in said last access request; and



when said determinations indicate a predetermined data contents comparison result of equality, promoting of said buffer store predetermined data from only a predetermined one of said plurality of data storage areas of said backing store accessed during said any series of requests irrespective of the data storage function requested during said last access request in said any series of requests, and for comparison results other than said equality comparison results, promoting no data from said backing store to said buffer store.

4,429,364

SEWING MACHINE-PATTERN DATA PROCESSOR

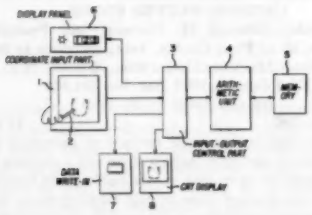
Hisaichi Maruyama, and Yasuji Matsumoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 183,635, Sep. 3, 1980, abandoned. This application Jun. 1, 1983, Ser. No. 498,689

Claims priority, application Japan, Sep. 3, 1979, 54-112535

Int. Cl.³ G06F *15/46*; D05B *19/00*

U.S. Cl. 364—400 **6 Claims**



1. A sewing machine-pattern data processor for producing pattern data adaptable for controlling operation of an automatic sewing machine, comprising:

a co-ordinate input device separate from said sewing machine, comprising an input plane defining plural co-ordinate positions, a manually operable stylus for selecting selected of said co-ordinate positions corresponding to a sewing pattern and means for forming sewing machine pattern data based on the selected co-ordinate positions;

an arithmetic and logic unit which receives the sewing machine pattern data input from the co-ordinate input device and converts the data to command data for a predetermined sewing machine unit control operation;

a memory for memorizing the command data converted by the arithmetic and logic unit;

a write-in device which reads out the data of the memory and writes the data in a non-volatile recording medium;

a pattern output device which outputs a command data memorized in the memory and includes a CRT display for displaying the sewing machine pattern.

4,429,365

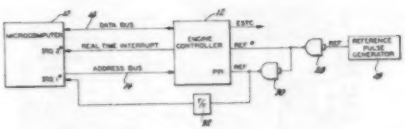
SPARK TIMING CONTROL SYSTEM

James E. Luckman, Anderson; John L. Kastura, Kokomo, and Thomas L. Voreis, Windfall, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1981, Ser. No. 291,614

Int. Cl.³ G05B *15/00*; F02P *5/00*

U.S. Cl. 364—431.08 **6 Claims**



1. A spark timing control system for an uneven firing engine having alternate long and short firing cycles in which successive piston top dead center positions are separated by relatively long and relatively short angular intervals of crankshaft rotation respectively,

said system comprising crankshaft position transducer means for producing a reference signal having a first characteristic which occurs at regular crankshaft angle positions and a second characteristic identifying whether the first characteristic occurred during said long or short firing cycle,

computer means for periodically developing a spark advance number referenced to the occurrence of said first characteristic and applicable to one of said firing cycles,

means responsive to said first characteristic of said reference signal for generating an interrupt, said computer means, in response to said interrupt, determining if said interrupt occurred in said one of said cycles based on said second characteristic of said reference signal and following such determination, modifying said spark advance number if said interrupt occurred in the other of said cycles to compensate for the difference in the displacement of successive piston top dead center positions from the crankshaft angle position where said first characteristic occurs, and

engine controller means responsive to said reference signal for generating a spark timing output signal based on said spark advance number.

4,429,366

MICROPROCESSOR-BASED LOAD MANAGEMENT TERMINAL WITH RESET

Jerry M. Kennon, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1981, Ser. No. 252,683

Int. Cl.³ G01R *21/00*; G06F *11/00*

U.S. Cl. 364—482 **11 Claims**

9. A microprocessor based load management terminal having a reset circuit, said load management terminal being a component in a power distribution system for delivering elec-

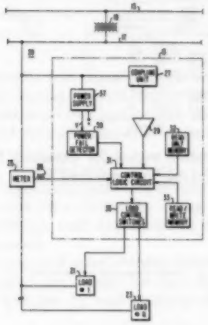
trical power and carrying information, said load management terminal comprising:

a power line coupling unit connecting said load management terminal to the power distribution system;

a signal receiver and conditioning unit having an input connected to said power line coupling unit and producing a command signal in response to said power line coupling unit;

memory means containing preprogrammed data and instructions;

a microprocessor connected to said signal receiver and coupling unit and to said memory means, said microprocessor performing load management functions in response to said command signal and producing a digital diagnostic output signal operable to a first state in response to one of said instructions and operable to a second state in response to another of said instructions, said microprocessor comprising a reset terminal operative when actuated to cause said microprocessor to enter a reset condition to execute an initialization sequence;



a first timer connected to said microprocessor and responsive to said first state of said diagnostic output signal, said first timer producing a first reset signal when the time during which said diagnostic output signal is in said first state exceeds a first predetermined time period, said first reset signal actuating said reset terminal; and

a second timer connected to said microprocessor and responsive to said second state of said diagnostic signal, said second timer producing a second reset signal when the time during which said diagnostic output signal is in said second state exceeds a second predetermined time period, said second reset signal actuating said reset terminal such that said first and second timers comprising the reset circuit.

4,429,367

SPEECH SYNTHESIZER APPARATUS

Hidenori Ikeda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

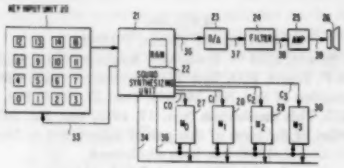
Filed Sep. 1, 1981, Ser. No. 298,409

Claims priority, application Japan, Sep. 1, 1980, 55-120841

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513 **5 Claims**

1. A speech synthesizer apparatus comprising a first memory device (M_0) having a first memory area and a second memory area, said first memory area including a plurality of memory blocks which have different quantities of memory locations and store a plurality of different speech information and said second memory area storing a plurality of name codes designating the respective memory blocks in said first memory area, a second memory device (M_1) having a first memory area with a plurality of memory blocks which have different quantities of memory locations and store a plurality of different speech information and a second memory area storing a plurality of name codes designating the respective memory blocks of said first memory area of said second memory device, and a synthesizing unit (**21**) having a memory means (**22**) having memory areas for storing the name codes in said first and second memory devices, means (**48, 49, 50**) for reading said name codes out of said first memory device and out of said second memory device and writing the read name codes into said memory means, means (IN) for receiving an input data, means (**44**) for



converting the received input data into address data designating at least one of the name codes stored in said memory means to read the designated name code out of said memory means, means (**51, 53**) for producing sequential addresses for accessing speech information of at least one memory block in said first memory device and/or said second memory device designated by said at least one name code read out of said memory means, and means (**42**) for synthesizing a speech signal by using the accessed speech information.

4,429,368

MICROPROGRAM-TESTING APPARATUS

Hajime Kurii, Wako, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

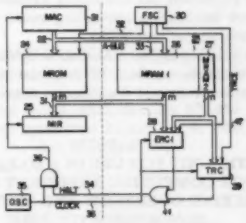
PCT No. PCT/JP79/00265, § 371 Date Aug. 13, 1980, § 102(e) Date Aug. 13, 1980, PCT Pub. No. WO80/01323, PCT Pub. Date Jun. 26, 1980

PCT Filed Oct. 19, 1979, Ser. No. 201,486

Claims priority, application Japan, Dec. 18, 1978, 53-156199

Int. Cl.³ G06F *9/22, 11/00*

U.S. Cl. 364—580 **11 Claims**



1. An apparatus for testing a microprogram used with a microprogram type electronic computer, which comprises:

a memory (**23**) formed of a first section in which a plurality of microinstructions for controlling the operation of the electronic computer are stored and a second section in which there are stored at least one of data for the detection of an error in the microinstructions and data for controlling the halt of the execution of said microinstructions;

an error detector (**28**), which, when data for the detection of an error is written in the second section, detects an error in the microinstructions stored in the first section of said memory (**23**) according to said error detection data;

a trace control circuit (**29**), which, when data for controlling the halt of the execution of a microprogram is stored in the second section of said memory (**23**), halts the execution of

the microinstructions stored in the first section of said memory (23) according to said data;

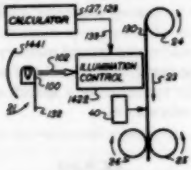
a function switching control circuit (30) for deciding the selective use of said memory (23) and a microprogram memory used with a microprogram, and also the selective use of said error detector (28) and trace control circuit (29); and

a read control circuit (43) for reading the contents of said memory (23).

4,429,369
ELECTRO-OPTICAL PRINTER

Albert L. Stanly, 2285 W. Broadway, Anaheim, Calif. 92804, and Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation of Ser. No. 754,647, Dec. 27, 1976, Pat. No. 4,236,223. This application Nov. 17, 1980, Ser. No. 207,160
The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.
Int. Cl.³ G06F *3/12*; G06K *15/12*
U.S. Cl. 364—710 **16 Claims**



1. A printer system for printing digital information, said printer system comprising:

command means for generating electrical command signals related to digital information to be printed;

an illumination source for generating illumination;

illumination controlling means for generating controlled illumination by controlling transmission of the illumination from said illumination source in response to the command signals;

means for projecting the controlled transmitted illumination from said illumination controlling means onto an illumination sensitive medium; and

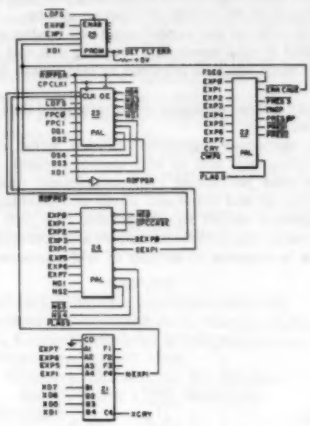
means for printing digital information by exposing an illumination sensitive medium in response to the controlled illumination from said illumination controlling means.

4,429,370
ARITHMETIC UNIT FOR USE IN A DATA PROCESSING SYSTEM FOR COMPUTING EXPONENT RESULTS AND DETECTING OVERFLOW AND UNDERFLOW CONDITIONS THEREOF

Jonathan S. Blau, Natick, and Josh Rosen, Westboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 23, 1981, Ser. No. 256,923
Int. Cl.³ G06F *7/48*
U.S. Cl. 364—748 **7 Claims**

1. In a data processing system, arithmetic computation means which includes exponent computation means operating on a pair of exponent operands for providing a final arithmetic exponent result which is subject to the occurrence of overflow or underflow conditions, one of said operands having a value which is capable of lying in a middle range in which case no overflow or underflow condition exists, in upper or lower ranges in which cases an overflow or underflow condition exists, or in crossover ranges in which cases the existence of an overflow or an underflow condition depends on the value of the other of said exponent operands, said arithmetic computation means further including means operable independently of said exponent computation means and further operable during the computation of the final arithmetic exponent result by said

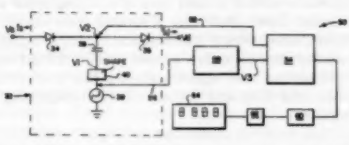


exponent computation means for detecting in which of said ranges the value of said one operand lies.

4,429,371
RELATIVE HORSEPOWER INDICATOR

Morton E. Brown, San Antonio, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Mar. 23, 1981, Ser. No. 246,289
Int. Cl.³ G06G *7/19, 7/64*
U.S. Cl. 364—803 **6 Claims**



1. A device for measuring relative changes in analog horsepower in an electrical model of a reciprocating compressor wherein the electrical model has a substantially sinusoidal driving voltage for modelling the position of the compressor piston and wherein the compressor pressure is modelled by an electrical pressure voltage, wherein the measuring device comprises:

means for measuring the driving voltage in the electrical model;

a phase shifter having a shifted output voltage, wherein the shifted output represents the driving voltage shifted 90°;

product means for obtaining the product of the pressure voltage in the electrical model and the shifted output voltage;

means for integrating the output from said product means; and

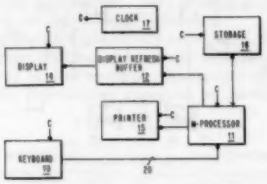
means for indicating the integrated signal level as a proportion of a preselected signal level.

4,429,372

METHOD FOR INTEGRATING STRUCTURED DATA AND STRING DATA ON A TEXT PROCESSING SYSTEM

Richard E. Berry, Georgetown, and John H. Wilson, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 273,569
Int. Cl.³ G06F *3/153, 3/12*
U.S. Cl. 364—900 **7 Claims**



1. In an interactive text processing system including a processor, keyboard, display, printer, main memory and auxiliary storage device, an improved method for integrating and processing structured data and text data in the same record comprising the steps of:

(a) displaying from said main memory a menu of predetermined data type codes including structured data field type codes and text data field type codes, selectable by an operator through said keyboard for defining the data fields in a record;

(b) establishing in said main memory a structured data field of fixed length in said record for each structured data field type code selected by said operator through said keyboard;

(c) establishing in main memory an auxiliary storage device address pointer code for each text data field type code selected by said operator through said keyboard;

(d) concatenating said structured data field type codes and said text data field type codes in said main memory in the order selected to form a data record format;

(e) processing input structured data under control of said structured data field type codes to form structured data fields for said data records;

(f) processing input text data under control of said text data field type codes by generating auxiliary storage device addresses for said text data and storing said text data including embedded format control codes at the generated addresses; and

(g) concatenating said structured data fields and said auxiliary storage device addresses into data records and storing said data records in said auxiliary storage device.

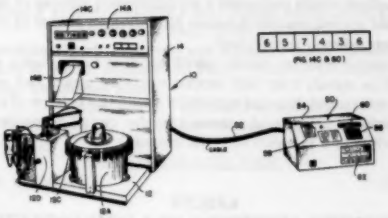
4,429,373

DATA ANALYZING SYSTEM FOR CLINICAL SPECTROPHOTOMETER

Taylor C. Fletcher, 1534 Sunny Crest Dr., Fullerton, Calif. 92635, and Neal P. Flora, 10870 Holmes Ave., Mira Loma, Calif. 91752

Filed Sep. 14, 1981, Ser. No. 301,739
Int. Cl.³ G01N *33/16*
U.S. Cl. 364—900 **4 Claims**

1. A data analyzing system for controlling the operation of a clinical spectrophotometer to enable the spectrophotometer to conduct a plurality of different assays and for directing the sequence of operations of the spectrophotometer for any particular assay, and for analyzing analog output data signals received from the spectrophotometer representing the results of such assays, said data analyzing system including: a microprocessor circuit; an interface circuit connected to the microprocessor circuit and to the spectrophotometer for interconnecting the data analyzing system to the spectrophotometer to introduce the output signals from the spectrophotometer to said microprocessor and to introduce control signals from the microprocessor to the spectrophotometer; an arithmetic processor circuit connected to the microprocessor and controlled thereby for calibrating the results of the assays made by the spectrophotometer and for converting the results into reportable units; a keyboard connected to the microprocessor circuit for enabling an operator to enter signals into the microprocesor representing the code number corresponding to a selected assay; an alphanumeric display panel connected to the microprocessor and responsive to signals from the microprocessor for displaying the name of the assay selected by the keyboard; a disc memory drive system connected to the microprocessor for storing information representing the particular assays to be performed by the spectrophotometer and for introducing signals to the microprocessor representing the sequence of operations of the particular assay selected by the keyboard to cause the microprocessor to introduce corresponding control signals to the spectrophotometer through said interface circuit; a printer circuit connected to the micrporocessor circuit and responsive to signals therefrom for printing out various settings of the spectrophotometer corresponding to the sequence of operations to be performed thereby in accordance with the particular test selected by the keyboard to be established for the selected assay, and further responsive to signals from the microprocessor representing calculations by said arithmetic processor circuit for printing out data relating to absorbance readings by the spectrophotometer in laboratory reportable units.

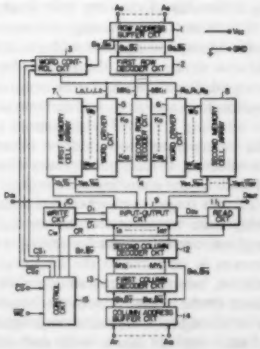


4,429,374

MEMORY ARRAY ADDRESSING

Nobuyoshi Tanimura, Musashino, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,654
Claims priority, application Japan, Jun. 4, 1980, 55-74247
Int. Cl.³ G11C *8/00*
U.S. Cl. 365—230 **9 Claims**



1. A semiconductor memory circuit device comprising:

a memory cell array comprising a plurality of memory cells arranged in rows and columns;

first means for receiving input row address signals, each of which comprises a predetermined number of bits, said first receiving means providing an output of row address signals;

a row decoder circuit which receives said row address signals from said first receiving means and provides output decoded signals for selecting a row from said memory cell array, said row decoder circuit being comprised of a plurality of NAND circuits;

a word driver circuit connected between the output of said row decoder circuit and said memory array;

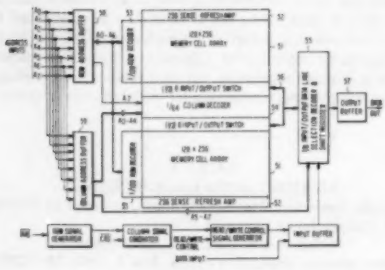
second means for receiving input column address signals, each of which comprises a predetermined number of bits, said second receiving means providing an output of column address signals; and

a column decoder circuit which receives said column address signals from said second receiving means and provides output decoded signals for selecting a column of said memory array, said column decoder circuit being comprised of a plurality of NOR circuits.

4,429,375
CONSECUTIVE ADDRESSING OF A SEMICONDUCTOR MEMORY

Satoru Kobayashi, and Shigeki Matsue, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,398
Claims priority, application Japan, Jul. 23, 1980, 55-100850
Int. Cl.³ G11C *7/00, 8/00*
U.S. Cl. 365—240 **11 Claims**

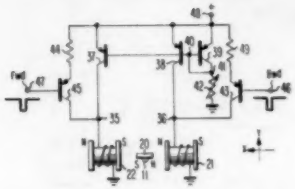


1. A semiconductor memory device comprising a memory array including a plurality of memory cells arranged in rows and columns, first means for receiving a row strobe signal, second means for incorporating row address information in response to said row strobe signal, third means for receiving a column strobe signal, fourth means for incorporating column address information in response to said column strobe signal, fifth means for selecting a row of said memory cell array in response to the incorporated row address information, and sixth means for selecting at least one column of said memory cell array, said sixth means including shift register means having a plurality of shift stages, each of output terminals of said shift stages being used to select the corresponding column when it is energized, decode means for setting a state of said shift register means in response to the incorporated column address information, means for generating a shift signal each time said column strobe signal is activated during a period when said row strobe signal is activated, and eighth means for supplying said shift register means with said shift signal to thereby change the column address location as selected by said shift register means.

4,429,376
VIDEO DISC STYLUS DEFLECTOR SYSTEM

Tomoki Saeki, Yokahama, Japan, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,394
Int. Cl.³ G11B *7/00, 9/00, 17/00*
U.S. Cl. 369—43 **10 Claims**



1. In a video disc playback system including a base for rotatably supporting a disc record and a carriage system for supporting and translating a signal pickup stylus radially across the disc in consonance with the desired speed of signal recover, an improved stylus deflector apparatus comprising:

a stylus arm having the signal pickup stylus secured to a first end thereof and having a second end;

a compliant coupler for securing the second end of the stylus arm to the carriage to permit pivotal motion of the stylus arm and engagement of the signal pickup stylus with the disc record;

a first electromechanical transducer connected proximate the second end of the stylus arm for producing controlled translations of the pickup stylus in a direction radially across the disc record;

a mechanical bias means connected between the carriage and the stylus arm proximate the first end thereof for providing a positive disc-stylus pressure;

a permanent magnet secured to the stylus arm having its interpolar axis transverse to the stylus arm and substantially parallel to the record surface during normal playback;

first and second electromagnetic coils coaxially aligned and secured to the carriage so that the permanent magnet is disposed therebetween with its interpolar axis parallel with the axis of the coils, and said permanent magnet being offset from the coil axes in a direction substantially normal to said disc record, in the normal playback position;

means for energizing the first and second coils with a substantially constant current component to create a magnetic field therebetween imparting a force on the permanent magnet in a direction normal to the disc record, said force tending to counteract bias variations produced by said mechanical bias means during disc playback and thereby tending to maintain said disc-stylus pressure constant.

4,429,377
ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A JACKET OPENING ENLARGING DEVICE

Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 3, 1982, Ser. No. 384,690
Claims priority, application Japan, Jun. 12, 1981, 56-90321
Int. Cl.³ G11B *23/04, 19/00*
U.S. Cl. 369—77.2 **6 Claims**

1. An apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket having a space for accommodating the rotary recording medium therein and an opening through which said rotary recording medium can enter and leave said jacket, and a lid

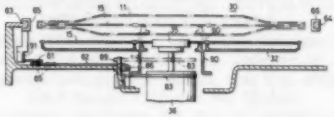
member inserted through said opening of the jacket for covering and closing the opening, said reproducing apparatus comprising:

an inserting opening through which the case is inserted;

clamping means disposed in at an innermost part of the reproducing apparatus, for clamping the rotary recording medium when the case is inserted into the reproducing apparatus and then the jacket is pulled out of the reproducing apparatus to leave the rotary recording medium within the reproducing apparatus;

a turntable for rotating the rotary recording medium thus left within the reproducing apparatus;

a jacket opening enlarging device provided in the vicinity of said inserting opening, and movable between a position in the vicinity of said inserting opening and said innermost part of the reproducing apparatus by passing over said



turntable, for enlarging said jacket opening upwards and downwards so as to mutually separate an upper plate and a lower plate of said jacket inserted into the reproducing apparatus through said inserting opening upwards and downwards; and

a jacket opening enlargement limiting mechanism provided to oppose parts in the vicinity of the right and left ends of said jacket inserted into the reproducing apparatus through said inserting opening, for receiving said upper and lower plates mutually separated upwards and downwards by said jacket opening enlarging device and limiting the displacement in the upward and downward directions,

said jacket opening being enlarged in a state where the enlargement is limited at the parts in the vicinity of the right and left ends thereof.

4,429,378

OPTICAL PICKUP DEVICE FOR USE IN A VIDEO AND/OR AUDIO DISC PLAYER

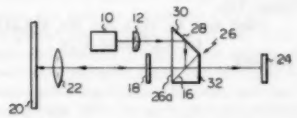
Katsuharu Sato, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,338

Claims priority, application Japan, Mar. 31, 1980, 55-42948

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—110 **9 Claims**



1. An optical pickup device for producing an electric signal representative of information recorded in the form of a light modulating pattern formed on a recording medium, which comprises: a light source (10) for emitting a plane-polarized light beam having a single polarizing plane; an object lens (22) positioned in the vicinity of said recording medium so as to focus a light beam applied thereto onto said recording medium in the form of a spot; a photo-electric transducer (24) for producing said electric signal in response to a light beam applied thereto; a quarter wave plate (18) positioned in the light path passing through said object lens (22) and said photo-electric transducer (24); and a single beam splitting prism (26,34) having a polarizing plane placed between said quarter wave plate (18) and said transducer (24) on said light path for directing said light beam supplied from said light source toward said quarter wave plate (18) and for allowing the light beam passed through said quarter wave plate (18) to pass therethrough toward said transducer (24) therein, said light source emitting said light beam toward said prism in a direction parallel to or along an optical axis passing through said object lens and said quarter wave plate, and said beam splitting prism having therein an inwardly reflective side surface (28) being inclined from said optical axis at an angle of 45° and inwardly reflective against an incident light thereto without respect to the polarization of said incident light.

4,429,379

DEVICE FOR CONTROLLING TONE ARM CARRYING MOVING COIL TYPE PICKUP

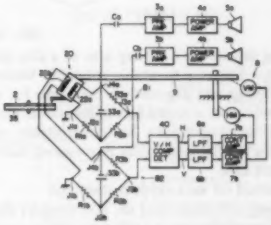
Katsuhiko Oguri, Fujisawa, and Kazuhiro Sato, Sagamihara, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 8, 1981, Ser. No. 309,806

Claims priority, application Japan, Oct. 9, 1980, 55-144547[U]

Int. Cl.³ G11B *3/10*; H04R *9/16*

U.S. Cl. 369—220 **8 Claims**



1. A device for controlling a tone arm carrying a moving coil type pickup, comprising:

(a) a moving coil assembly having left and right channel moving coils arranged to move in a magnetic field in accordance with the displacement of a cantilever having a stylus which traces the surface of a phonograph record, each of said moving coils being made of a magnetoresistance material;

(b) a tone arm vertically and horizontally rotatably mounted on a stationary member, said tone arm carrying said moving coil assembly;

(c) a tone arm control mechanism for controlling the vertical and/or horizontal attitude of said tone arm;

(d) first means for detecting a variation in the electrical resistance of said left channel moving coil passing through the magnetic field;

(e) second means for detecting a variation in the electrical resistance of said right channel moving coil passing through the magnetic field;

(f) third means responsive to the detected variations in electrical resistances from said first and second means for generating a vertical component output signal indicative of a vertical displacement of said moving coil assembly and/or a horizontal component output signal indicative of a horizontal displacement of said moving coil assembly; and

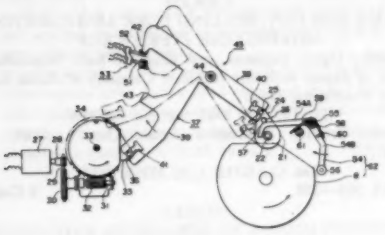
(g) fourth means responsive to said vertical component output signal and/or horizontal component output signal for generating a vertical control signal and/or a horizontal control signal which are/is applied to said tone arm control mechanism for controlling the vertical and/or horizontal attitude(s) of said tone arm so that each of said left

and right channel moving coils is positioned at an optimum operating point with respect to said magnetic field.

4,429,380
BRAKING DEVICE FOR A PICKUP ARM OF A DISK PLAYER OR THE LIKE

Kazuo Urata, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 24, 1981, Ser. No. 305,363
Claims priority, application Japan, Dec. 29, 1980, 55-187937[U]
Int. Cl.³ G11B *17/06*
U.S. Cl. 369—230 **6 Claims**



1. A braking device for a pickup arm of a disc player of the type including a frame, a turntable rotatably mounted on the frame, and a pickup arm disposed on the frame for vertical and horizontal movements relative to the turntable, comprising:

horizontally moving means for controllably moving the pickup arm for the horizontal movement, having

a coil support disc

a coil supported on said support disc, and

a magnet, said coil supported on said support disc and

said magnet co-operating for effecting the horizontal movement of the pickup arm;

cueing control means for controllably moving the pickup arm for the vertical movement between an upper limit position and a lower limit position where the pickup arm is in a playing mode, having

a cueing lever pivotally mounted on the frame,

drive means for rotating said cueing lever,

first cam means, rotatably mounted on the frame and

rotated by said cueing lever, and

an arm lifter following said first cam means for vertical movement to move the pickup arm for the vertical movement; and

braking means being actuated and applying a braking action to the horizontal movement of the pickup arm when the pickup arm is in a non-playing mode, having

a brake lever pivotally mounted on the frame, and

a braking force applying member defined in said horizontally moving means;

said brake lever being actuated by said first cam means of the cueing control means to abut against the braking force applying member for exerting the braking force.

4,429,381
STRAIGHT LINE TRACKING TURNTABLE

Rollie W. Paulson, 6119 9th Ave. South, Gulfport, Fla. 33707

Continuation-in-part of Ser. No. 185,200, Sep. 8, 1980, abandoned. This application Dec. 11, 1981, Ser. No. 329,679
Int. Cl.³ G11B *3/60*
U.S. Cl. 369—266 **4 Claims**

1. A sound reproducing device, comprising,

a horizontally disposed, rotatably mounted turntable member,

a first motor means for rotating said turntable member at a substantially uniform rate of speed so that a record member disposed in supported relation thereupon rotates at a substantially uniform rate of speed conjointly therewith,

a second motor means for imparting linear motion, along a predetermined path, to said turntable member,

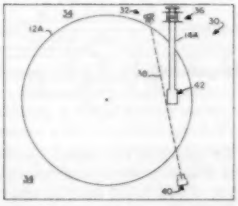
said path coincident with an axis of symmetry of said turntable member,

a pivotally mounted tone arm member,

a stylus member carried by said tone arm member so that the free end of said stylus member operatively engages the spiral grooves formed in said record member,

said tone arm disposed in spaced parallel relation to a first imaginary line tangent to the outer peripheral boundary of said turntable member,

said stylus further disposed in registration with a second imaginary line perpendicular to said first imaginary line,



said second imaginary line coincident with the predetermined path along which said turntable member travels,

a sensing means for detecting angular displacement of said tone arm member,

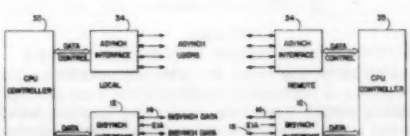
said sensing means adapted to provide a signal to said second motor means to increase or decrease the rate of turntable linear motion along said path by an amount sufficient to prevent said tone arm member from undergoing angular rotation relative to its pivotal mount attendant operation of the device,

said second motor means including a constant speed motor that drives said turntable member at a predetermined speed that is slightly greater than the speed that would be required to maintain the initial position of the stylus during the time said record member is rotating conjointly with said turntable.

4,429,382
MICROPROCESSOR MULTIPLEXER METHOD AND APPARATUS FOR BISYNCHRONOUS DATA

Larry Greenstein, Miami, and Michael B. Marshall, Ft. Lauderdale, both of Fla., assignors to Racal Data Communications Inc., Miami, Fla.

Filed Aug. 16, 1982, Ser. No. 408,181
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—80 **15 Claims**



7. Data multiplexer apparatus for statistically multiplexing synchronous and asynchronous data onto a data link comprising:

means including a first central processor means and supplied with a plurality of asynchronous data channels for controlling application of said asynchronous data onto said link;

means including a second central processor means and supplied with a plurality of synchronous data channels;

said first and second processor means interacting such that asynchronous and synchronous data are statistically multiplexed together when the synchronous channels do not require full transmission capacity of the data link and such that statistically multiplexed synchronous data for one or more of said synchronous data channels occupies 100% of the transmission capacity of said data link when required.

4,429,383

METHOD FOR SEIZING TIME SLOTS OF A TIME-DIVISION MULTIPLEX SYSTEM WITH DYNAMIC MULTIPLEXERS

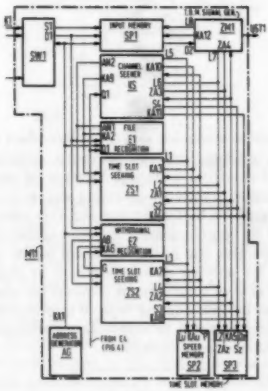
Herbert Finck, Wolfratshausen, and Konrad Reisinger, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,736

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001417

Int. Cl.³ H04J *3/16*

U.S. Cl. 370—84 **10 Claims**



1. A method for seizing time slots in a time-division multiplex system with dynamic multiplexers which allows transmission of data channels between two stations in both directions, wherein the time slot number 0 through $(-1+2^m \cdot n)$ can be allocated in sequence to 2^m time slots of the time-division multiplex frame, and wherein groups of the order i of 2^i time slots per time-division multiplex frame can be seized with data in different channels having differing bit rates, and the time slot numbers of said groups differ by multiples of n, where m and n are positive whole numbers and i is equal to 0 or equal to a positive, whole number, comprising the steps of:

a. before the seizure of time slots, the order i of the required group of time slots is determined as a function of the existing bit rate of the data to be transmitted;

b. for identifying free time slots, the time slot groups of the order i within a first time slot group of the order m are checked in a fixed sequence (R) until a free time slot group of the order i is found;

c. when no free time slot group of the order i has been found in the search for free time slot groups within the order m, the search is carried out within further time slot groups of the order m;

d. an address is allocated to each time slot of a free group of time slots which has been found and said allocation is signalled to the multiplexer of the remote station which in turn occasions the corresponding allocation;

e. independently of the identification of a group of free time slots, seized groups of time slots are sought in reversed sequence to the fixed sequence (R);

f. as soon as a seized group of time slots is found, in the fixed sequence (R), a new group of free time slots of the same order as the seized group is sought which, relative to the fixed sequence (R), must lie in front of the seized group found;

g. when the new groups of free time slots has been found, the address allocated to the seized group is allocated to said free group of time slots and this allocation is signalled to the multiplexer of the remote station which in turn occasions the same allocation;

h. as soon as the new group of time slots is seized, the previously seized group of time slots is released.

4,429,384

COMMUNICATION SYSTEM HAVING AN INFORMATION BUS AND CIRCUITS THEREFOR

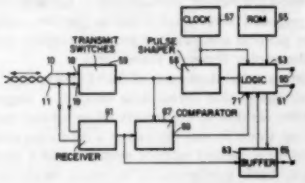
Cecil H. Kaplinsky, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,673

Claims priority, application Netherlands, Apr. 23, 1980, 8002345

Int. Cl.³ H04J *6/00*

U.S. Cl. 370—85 **9 Claims**



1. A communicaton system for the transmission of digital information through a single channel information bus between two or more out of a number of asynchronously operating apparatus coupled to the information bus, each apparatus including at least a digital data processing portion having a clock generator for the generation of a periodic clock signal, and a control unit, said data processing portion being coupled to the information bus by means of the control unit, said control unit having a transmission switch that can be switched by the control unit between an "OFF"-state and an "ON"-state to transmit digital signals to the information bus, an output of said transmission switch forming the output of the control unit being connected to the information bus, such that the two or more transmission switches of the two or more operating apparatus together with the information bus form an AND-circuit, which ANDs the signals transmitted to the information bus by these apparatus, the information bus being in the "ON" state only if all connected transmission switch outputs are in the "ON" state, and being in the "OFF" state if at least one of said outputs is in the "OFF" state, whereby the digital signals are represented as electrical pulses transmitted to the information bus by bringing the output of a transmission switch in the "OFF" state during at least a portion of an information bit period, which period has the length of an integral number of periods of the periodic clock signal, characterized in that:

when an apparatus transmits information over the information bus, its transmission switch is controlled such that for the transmission of a pulse signifying a zero information bit, the transmission switch is in the "OFF" state during a portion of the information bit period greater than half that period and equal to an integral number of periods of the periodic clock signal, and for the transmission of a pulse signifying a one information bit during a portion of the

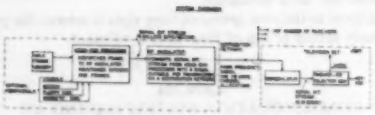
information bit period at least a factor of 2.1 shorter than the duration of a pulse signifying a zero information bit.

4,429,385

METHOD AND APPARATUS FOR DIGITAL SERIAL SCANNING WITH HIERARCHICAL AND RELATIONAL ACCESS

Richard J. Cichelli, Allentown, and Michael O. Thompson, Bethlehem, both of Pa., assignors to American Newspaper Publishers Association, Washington, D.C.

Filed Dec. 31, 1981, Ser. No. 336,224
Int. Cl.³ H04J *3/00*; H04N *7/08*
U.S. Cl. 370—92 **16 Claims**



1. An information retrieval method from broadcast information which supports both hierarchical and relational access to said broadcast information by one or more receiving units, comprising the steps of:

A. defining items of information having plural characteristic elements within frames and collecting said frames, wherein each frame further comprises a fixed-length digitally encoded header portion and a variable-length digitally encoded screen information portion, wherein said header portion comprises a path descriptor and an attribute descriptor for each frame; and

B. forming a serial data base of said frames; and

C. broadcasting said serial data base in a sequential and repetitive fashion to a plurality of receiving units; and

D. defining those frames desired at a receiving unit by there generating a desired pattern selector and a desired mask selector, each comprised of separate fields of digitally encoded information elements and then scanning the header portion of each frame as it is being serially received at said receiving unit, and

E. selecting frames by comparing, in an elementwise fashion, for a match of the path and attribute descriptor portions of each frame header with the previously generated, desired pattern selector according to the conditions imposed by the corresponding elements of the previously generated, desired mask selector; and

F. grabbing selected frames and generating a graphical or alphanumeric video display of the screen information for the said frame.

4,429,386

BUFFER ARRANGEMENT OF A PCM EXCHANGE SYSTEM

Maynard Graden, Reston, Va., assignor to Siemens Corporation, Iselin, N.J.

Filed Jan. 5, 1981, Ser. No. 222,700
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—100 **4 Claims**

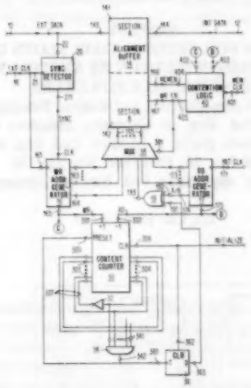
1. A buffer arrangement of a pulse code multiplex exchange system for compensating both short and long term phase drift of information between a transmitting and a receiving data path, each data path being plesiochronously controlled by a first clock and a second clock, respectively, for transmitting of information blocks each composed of at least one pulse frame being, in turn, divided into a plurality of code words each representing a sample of a corresponding channel, said buffer arrangement comprising in combination:

(a) an alignment buffer connected between the first and the second data path and being composed of two sections, each having a capacity for storing alternately one of two subsequent information blocks in continuous storage locations;

(b) buffer addressing means associated with said alignment buffer for selecting write addresses and read addresses;

(c) address generating means connected to said buffer addressing means for generating consecutive write addresses for said alignment buffer under control of said first clock and for generating consecutive read addresses under control of said second clock;

(d) means for monitoring an offset between a current read address and the respective write address with respect to a predetermined minimal guard distance and for initiating a



slip operation whenever said offset falls short of the guard distance, wherein said slip operation constitutes a read address jump from a storage location of one alignment buffer section to the corresponding storage location of the other alignment buffer section and this address jump is achieved by complementing the read address bit identifying a respective one of the alignment buffer sections; and

(e) means for solving access conflicts to said alignment buffer in case of simultaneous requests for read and write operations by granting the type of information requested first without completely suppressing a subsequent request for the other type of operation.

4,429,387

SPECIAL CHARACTER SEQUENCE DETECTION CIRCUIT ARRANGEMENT

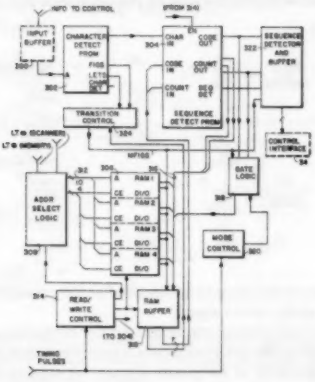
Stanley X. Kaminski, Conshohocken, Pa., assignor to Siemens Corporation, Iselin, N.J.

Filed Feb. 5, 1982, Ser. No. 346,228
Int. Cl.³ H04J *3/12*; H04Q *11/04*
U.S. Cl. 370—110.1 **15 Claims**

1. A special character sequence detection circuit arrangement for use with a central exchange of a time multiplex digital telecommunications system, said central exchange having line terminators each adapted to be connected to a respective data terminal and central data transfer control means including central timer means for generating central timing pulses, storage means for storing cross-connect control information, selecting means for generating address signals in the form of line terminator numbers each activating a respective line terminator to send a data character, and data interface means for establishing temporary data links between line terminators, wherein an established set of data characters includes special characters which, when sent out repetitively by the same line terminator during subsequent scan cycles and a predetermined number of times are recognized and evaluated for triggering a corresponding control process, said special character sequence detection circuit arrangement comprising:

(a) a random access memory having address inputs, data inputs, data outputs and memory locations each associated with a respective one of the line terminators, said address inputs connected to receive the currently generated line terminator number and said memory locations containing both a previous character code specifying the previously transmitted data character and a previous count designating the number of times the specified data character was previously sent;

(b) a first read-only memory having address inputs connected to receive a currently transmitted data character, having memory locations programmed to assign an individual character code to each special character and a common non-special character code to non-special characters, respectively, and having data outputs furnishing this current character code;



(c) a second read-only memory connected to receive at address inputs the current character code from the first read-only memory, and both the previous character code and the previous count number from the random access memory, having memory locations programmed to derive from the received address information output signals representing in combination the current character code and an incremented count number both furnished at data outputs to be stored in the random access memory at the currently selected memory location and programmed to generate in dependence upon a maximum count a detection control signal representing the status of a detected special character sequence.

4,429,388

FIELD PROGRAMMABLE DEVICE WITH INTERNAL DYNAMIC TEST CIRCUIT

Toshitaka Fukushima, Yokohama; Kazumi Koyama, Tsukui, and Kouji Ueno, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 8, 1980, Ser. No. 214,210
Claims priority, application Japan, Dec. 18, 1979, 54-164333
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—21 **40 Claims**

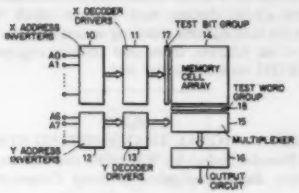
1. A field programmable device comprising:

a memory cell array including memory cells;

a plurality of bit lines operatively connected to corresponding ones of said memory cells;

a plurality of word lines operatively connected to corresponding ones of said memory cells, and formed at angles with and intersecting said bit lines; and

test rows respectively, operatively connected to one plurality of said plurality of word lines and said plurality of bit lines, each of said test rows comprising memory cells having a specified write-in ratio, one of said test rows



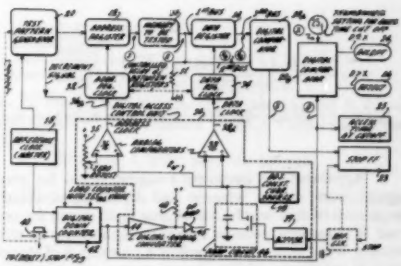
having a write-in ratio different from said write-in ratio of each of the remainder of said test rows.

4,429,389

TEST PATTERN ADDRESS GENERATOR

Robert D. Catiller, Garden Grove, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 26, 1981, Ser. No. 267,041
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—21 **11 Claims**



10. A test pattern generator system for generating a series of addresses for testing access time reliability of data bits residing in a ROM memory having row and column drivers, said pattern generator system comprising:

(a) address generating means for generating a series of addresses wherein said first, third, and subsequently generated odd-sequences of addresses are incremented by "one", and said second, fourth, and subsequently generated even-sequences of addresses are the complement of the address just preceding, said sequence of address being conveyed to an address register means and functioning to exercise all the row-column combinations of said ROM memory undergoing test during a series of variable-time test cycles;

(b) said address register means for temporarily storing each address generated by said address generating means and for subsequently transferring each of said generated addresses to said ROM memory at the frequency rate of a first master clock;

(c) address clocking means, connected to said address register means, for triggering the transfer of said stored address in said address register means, to said ROM memory under test, said address clocking means triggering said address register means at the frequency rate of said first master clock;

(d) said first master clock for initiating a controlled delay circuit means to periodically activate said address clocking means and also to trigger a flip-flop means which activates said address generating means at one half the frequency of said first master clock means;

(e) a second clock which includes said flip-flop means trig-

gered by said first master clock means for activating said address generating means at one-half the frequency rate of said first master clock;

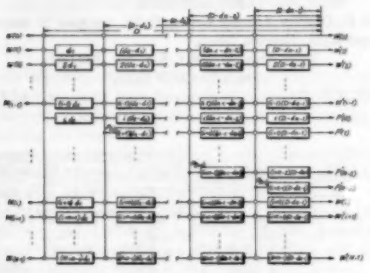
(f) said controlled-delay circuit means functioning to execute a test cycle during each master clock time-period, whereby said address clocking means initiates the application of an address, from said address register means, to said ROM memory under test.

4,429,390

DIGITAL SIGNAL TRANSMITTING SYSTEM

Takenori Sonoda; Nobuhiko Watanabe, and Masato Tanaka, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,848
Claims priority, application Japan, Aug. 14, 1980, 55-112014
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **11 Claims**



1. Apparatus for encoding a digital signal for protection against burst errors, wherein said digital signal occurs as N sequences of data words, comprising input means for receiving said N sequences; encoder means for generating an error correcting word sequence, in each of a plurality n of stages, from said N sequences of data words in a previous stage; delay means for delaying respective words of said N sequences by respective different delay times of $(D-d_i)$ words from an output of said n stages, in each of said n stages, where i is an index identifying an associated one of said n stages and takes on a value i=0 to n−1, and with said N sequences and the n error correcting word sequences at the output of said n stages being delayed with respective total delay times that differ from one another by an integral multiple of a number D of data words; and distributing means forming blocks of the N data word sequences and n error correcting word sequences and distributing such blocks cyclically among a plurality M of transmitting paths; wherein the values of M, N, n, D, and d_i are all positive integers which satisfy the conditions that

the least common multiple of any two values of $(D-d_i)$ is greater than $(N+n-1)D$; and

for any value of $(D-d_1)$, $(D-d_i)$ and M are relatively prime.

4,429,391

FAULT AND ERROR DETECTION ARRANGEMENT

Robert C. Lee, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 4, 1981, Ser. No. 259,980
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **16 Claims**

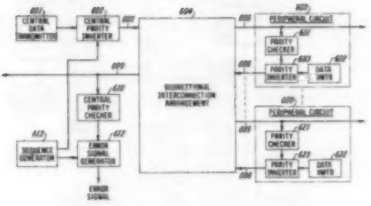
1. A fault and error detection arrangement comprising:

central data transmitting means for transmitting data words comprising a data portion and a parity bit derived from that data portion in predetermined channels on a first central time-multiplexed line;

a plurality of peripheral circuits; and

connection means for routing data words from said first central time-multiplexed line to said plurality of peripheral circuits such that each of said peripheral circuits receives data words from a unique one of said channels on said first central time-multiplexed line;

wherein each of said plurality of peripheral circuits comprises peripheral parity checking means connected to said connection means for generating parity invert signals when the parity bit of a data word routed to said peripheral circuit by said connection means is found to be inverted, peripheral data transmitting means for transmitting to said connection means data words comprising a data portion and a parity bit derived from that data portion, and peripheral parity inverting means connected to the peripheral parity checking means and the peripheral data transmitting means of that peripheral circuit and responsive to said parity invert signals for inverting the parity bit of the next data word transmitted to said connection means by the peripheral data transmitting



means of that peripheral circuit after the generation of one of said parity invert signal;

wherein said connection means further comprises means connected to the peripheral data transmitting means of each of said plurality of peripheral circuits for routing data words, transmitted to said connection means by the peripheral data transmitting means of each of said plurality of peripheral circuits, to a unique one of a plurality of channels on a second central time-multiplexed line; and

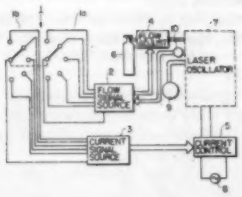
wherein said fault and error detection arrangement further comprises central parity checking means, connected to said connection means by said second central time-multiplexed line and responsive to data words on said second central time-multiplexed line, for generating an inverted parity received signal when the parity bit of a given data word on said second central time-multiplexed line is determined to be inverted.

4,429,392

LASER OUTPUT CONTROLLING DEVICE

Kenichi Yoshida; Kimizo Ono; Katsuyoshi Sunago; Shinya Takenaka, and Tohru Iwai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 21, 1981, Ser. No. 332,776
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—9 **6 Claims**



1. In a gas laser of the type including pressure control means

for controlling a laser gas pressure in response to a pressure control signal and current control means for controlling a laser discharge current in response to a current control signal, the improvement comprising:

selection means for selecting a plurality of desired laser output levels including

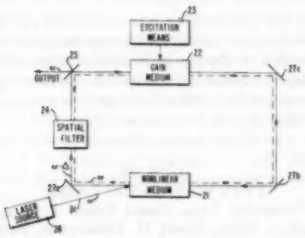
output control means for simultaneously varying both said pressure control and current control signals in accordance with operation of said selection means.

4,429,393

DOUBLE PHASE-CONJUGATE RING RESONATOR

Concetto R. Giuliano, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 12, 1981, Ser. No. 273,121
Int. Cl.³ H01S 3/10
U.S. Cl. 372—21 **6 Claims**



1. A double phase-conjugate ring resonator comprising:

a plurality of optical energy reflecting elements disposed along a closed optical path;

a nonlinear medium disposed along said optical path, said medium being capable of undergoing stimulated Brillouin scattering;

a gain medium disposed along said optical path for providing, when excited, amplified laser light at a first predetermined frequency along said optical path which impinges upon opposite ends of said nonlinear medium, such that doppler wavelength shifts, which occur when the laser light impinges upon one end of said nonlinear medium due to the motion of the acoustic waves which give rise to said stimulated Brillouin scattering process are cancelled when the reflected laser light impinges upon the opposite end of said nonlinear medium;

excitation means for exciting said gain medium to provide said amplified laser light;

a laser light source disposed so as to apply laser light to one end of said nonlinear medium, said light having sufficient power to induce said stimulated Brillouin scattering in said nonlinear medium; and

output means disposed along said optical path for coupling light at said predetermined frequency out of said path to provide an output beam from said resonator.

4,429,394

CONDUCTION COOLED SOLID STATE LASER

Steve Guch, Jr., Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,838
Int. Cl.³ H01S 3/04
U.S. Cl. 372—34 **9 Claims**

1. A conductively cooled laser assembly comprising

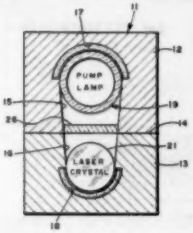
a housing constituting a heat sink having an elongated pump cavity and comprising first and second sections

a pump lamp in said cavity within said first section,

a laser crystal in said cavity within said second section,

a totally reflective element and a partially transmissive element adjacent to opposite ends, respectively, of said crystal and defining therebetween the laser cavity,

thin optically reflective thermally conductive layers engaging the exterior surfaces, respectively, of said lamp and said crystal adjacent to said housing, and



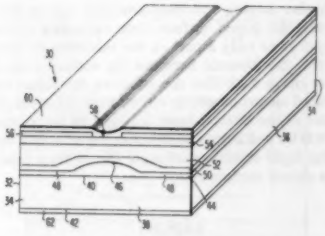
thermally conductive material separate from said layer and said housing packed between and in engagement with each of said layers and said housing whereby heat from said lamp and said crystal is transmitted through said layers and said material to said housing.

4,429,395

SEMICONDUCTOR LASER

Gregory H. Olsen, East Windsor, N.J., and Thomas J. Zamerowski, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,915
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 **9 Claims**



1. A semiconductor laser comprising

a semiconductor body having two end faces, at least one of which is partially transmissive of light, and including a substrate having opposed major surfaces and a rounded ridge extending outwards in a major surface thereof and extending between the two end faces;

an active layer overlying the substrate and increasing in thickness in the lateral direction from the portion thereof which overlies the peak of the ridge toward the base of the ridge;

a confinement layer overlying the active layer;

a first electrically conducting layer overlying a portion of the confinement layer over the ridge; and

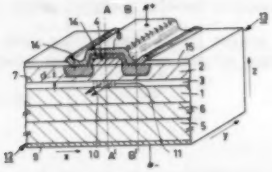
a second electrically conducting layer overlying a portion of the second major surface of the substrate;

wherein the substrate is of one conductivity type and the confinement layer is of the opposite conductivity type and wherein the index of refraction of the active layer is greater than that of the substrate and that of the confinement layer.

4,429,396
SEMICONDUCTOR LASER HAVING A DOPED SURFACE ZONE

Peter J. de Waard, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,438
Claims priority, application Netherlands, Jun. 27, 1980, 8003728
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 9 Claims



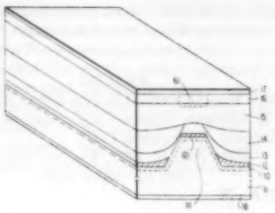
1. A semiconductor laser having a semiconductor body comprising a resonator and a first passive semiconductor layer of a first coductivity type, an active semiconductor layer on said first layer, a second passive semiconductor layer of the second opposite conductivity type on the active layer, a strip-shaped semiconductor contact layer of the second conductivity type on the second passive layer, and contact means for applying a voltage in the forward direction between the contact layer and the first passive layer to generate coherent electromagnetic radiation in a strip-shaped part of the active layer underlying the contact layer within said resonator, the passive layers having a smaller refractive index for the generated radiation than the active layer, a doped surface zone of the second conductivity type which extends over at least part of the thickness of the contact layer and extends in the second passive layer adjacent the contact layer, said surface zone having a higher doping concentration than that of the second passive layer, the doped surface zone extending adjacent the contact layer over only a part of the thickness of the second passive layer, the distance between the surface zone and the active layer being such that the effective refractive index for said generated electromagnetic radiation in the layer structure at the center of the contact layer is larger by an amount equal to at least 0.0005 and at most 0.005 than the effective refractive index in the layer structure adjacent the contact layer at the area of the doped surface zone.

4,429,397
BURIED HETEROSTRUCTURE LASER DIODE

Mitsunori Sugimoto, and Hidenori Nomura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,508
Claims priority, application Japan, Jun. 26, 1980, 55-87042; Jun. 26, 1980, 55-87047; Jun. 26, 1980, 55-87049; Jun. 26, 1980, 55-87050
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 12 Claims

1. A buried heterostructure laser diode comprising a semiconductor crystal having a pair of principal surfaces and a pair of reflective end surfaces constituting an optical resonator, and a pair of electrodes, said semiconductor crystal including a base semiconductor region having a mesa portion and having a first conductivity type, said mesa portion being elongated between said pair of reflective end surfaces in a stripe geometry, said semiconductor crystal further including a first semiconductor layer provided on a top surface of said mesa portion and having a band gap smaller than that of said base region and extending between said pair of reflective end surfaces in a stripe geometry, a second semiconductor layer having a second conductivity type and a band gap larger than that of said first layer and having a first region covering a top surface of said first layer, a second region covering a side surface of each of said first layer and said mesa portion, and a third region covering the other side surfaces of said first layer and said mesa portion, a pair of third semiconductor layers provided respectively on said second and third regions of said second layer and

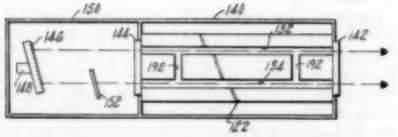


having said first conductivity type and a band gap larger than that of said first layer, and a fourth semiconductor layer commonly provided on the top surfaces of said second layer and said third layers and having said second conductivity type and a band gap larger than that of said first layer, said electrodes being provided on said principal surfaces.

4,429,398
TWIN WAVEGUIDE LASER

Peter P. Chenausky, Avon, Conn.; Robert J. Mongeon, East Longmeadow, Mass.; Erroll H. Drinkwater, Portland, and Lanny M. Laughman, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1982, Ser. No. 348,565
Int. Cl.³ H01S 3/03
U.S. Cl. 372—64 3 Claims



1. A waveguide laser system comprising:
a ceramic member having a plurality of passages containing a gain medium fashioned therein;
first and second electrodes disposed on opposite sides of said plurality of waveguide passages in said ceramic member for supplying power to said gain medium;
means for resonating optical radiation in said gain medium;
means for supplying radio-frequency power to said first and second electrodes so that each of said first and second electrodes supplies electromagnetic radiation to all of said plurality of passages.

4,429,399
GAS LASER TUBE

Takashi Kaneko, and Tokihiko Shidara, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

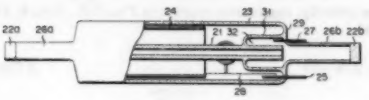
Filed Mar. 3, 1981, Ser. No. 240,237
Int. Cl.³ H01S 3/03
U.S. Cl. 372—65 3 Claims

1. A gas laser tube comprising:
a cylindrical envelope,
a pair of end tubes each mounted at one end to respective end walls of said envelope and extending outwardly therefrom along an axis and having reflective members at the

other end thereof, said pair of end tubes being of smaller diameter than that of said envelope;

a capillary tube;

a capillary tube holding member comprising a tube which has a diameter larger than that of said end tube and whose one end part is connected to the inner surface of one of said end walls of said envelope and the other end part is connected to said capillary tube adjacent one end of said envelope together with said one end wall and said capillary tube said holding member extending inwardly from



said one end wall to provide a space within said envelope together with said one end wall;

a cathode comprising a metal cylinder arranged in the vicinity of the inner surface of said envelope;

a cathode terminal connected to said cathode and mounted to extend through said end wall to which is mounted said capillary tube; and

an anode terminal protruding from said space to communicate with the interior of said capillary tube through said end wall and being substantially parallel to said cathode terminal.

4,429,400

LASERS

Alan S. Kaye, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 16, 1981, Ser. No. 312,133

Claims priority, application United Kingdom, Nov. 12, 1980, 8036332

Int. Cl.³ H01S *3/08*

U.S. Cl. 372—95 **9 Claims**

1. Laser apparatus comprising means forming a laser, said laser having an unstable optical cavity including an output mirror having an off-axis hole therein through which laser radiation can pass to maintain lasing action in an active medium situated in the laser optical cavity, wherein the output mirror is so shaped and positioned as to present an elliptical profile to laser radiation incident upon it, the major axis of the ellipse extending in the direction of offset of the hole in the output mirror.

4,429,401

MOLTEN-METAL LIQUID LEVEL SENSOR

Kenneth Avicola, Kingwood, Tex., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Dec. 4, 1981, Ser. No. 327,633

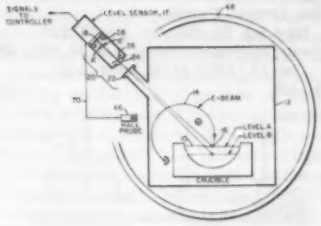
Int. Cl.³ H01J *37/305*

U.S. Cl. 373—12 **13 Claims**

1. Apparatus for measuring the level of a molten metal pool in an electron beam evaporator comprising:

means for evaporating a material from a localized surface region having evaporating energy applied thereto, to produce evaporation of the material therefrom and emission of energy therefrom;

the position of said surface region moving with the evaporation of said material;



means remote from said surface region and responsive to the energy emitted from said surface region for detecting the position of said surface region.

4,429,402

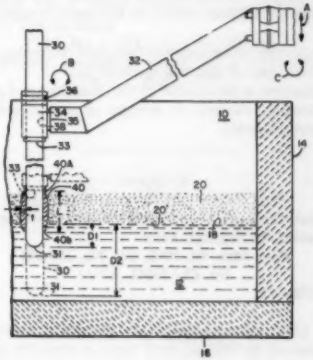
DEVICES FOR USE IN A GLASS-MELTING FURNACE

Harold J. Carley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1981, Ser. No. 317,995

Int. Cl.³ C03B *5/027*

U.S. Cl. 373—37 **34 Claims**



1. A method of protecting or shielding from oxygen an oxidizable device within the glass melting furnace, said furnace containing a supply of molten glass having an upper free surface, and the device being at an elevated temperature above an oxidizing temperature thereof, comprising the steps of:

dipping the device into the molten glass to a selected immersion level along a selected length thereof susceptible to temperatures in excess of the oxidation temperature;

maintaining the device at the immersion level a sufficient time in order to allow the molten glass to adhere to the device to form a coating having upper and lower margins and a selected length;

withdrawing the device and the adhered molten glass coating from the bath at least to a selected operating level above the immersion level such that the device is shielded from oxidizing agents along the selected length;

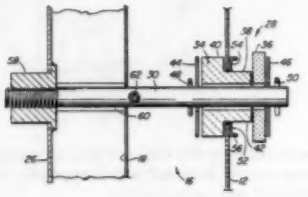
maintaining an upper margin of the coatings above the upper free surface of the glass; and

maintaiing the device in an uncooled condition.

4,429,403
HEATING ELEMENT INSULATING AND SUPPORT SYSTEM

John H. Hooper, Oakville, Canada, assignor to Vac-Aero International Inc., Ontario, Canada

Filed Sep. 23, 1982, Ser. No. 422,029
Claims priority, application Canada, Sep. 30, 1981, 387011
Int. Cl.³ F27D 11/02; H05B 3/02
U.S. Cl. 373—128 8 Claims



1. An improved support means for a resistance heating element of a vacuum furnace, said support means comprising a support liner, a heating element support assembly and a rod member interconnecting the support liner and the element support assembly;

said element support assembly being mounted on the inner end of said rod and including a pair of insulators concentrically located on said rod and defining between them an insulated groove freely supporting said heating element thereon;

means locating retaining the element support assembly on the inner end of said rod;

a retaining rod interconnecting adjacent rod members and spacing the support liner from the element support assembly;

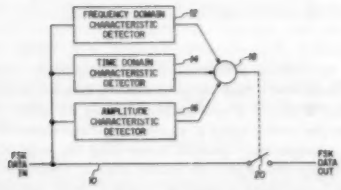
means secured to the support liner and releasably engaging the outer end of said rod member; and

means located in the groove of the insulators and secured to the heating element to strengthen said element at the support assembly.

4,429,404
FSK DATA OPERATED SWITCH

Don L. Mai, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 18, 1982, Ser. No. 359,381
Int. Cl.³ H04L 27/14
U.S. Cl. 375—76 15 Claims



4. A switch operated by data other than amplitude modulated data, for controlling the transmission of said data, comprising:

means for detecting the frequency domain characteristics of said data so as to produce a first indication of the presence of said data;

means for detecting the time domain characteristics of said data so as to produce a second indication of the presence of said data;

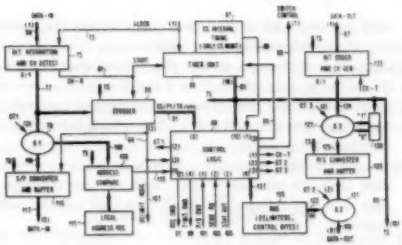
a switch for controlling the transmission of said data; and

summing means responsive to said first indication and said second indication for controlling said switch to enable transmission upon the detection of both said first and second indications.

4,429,405
METHOD OF TRANSMITTING INFORMATION BETWEEN STATIONS ATTACHED TO A UNIDIRECTIONAL TRANSMISSION RING

Werner Bux, Richterwil, and Hans R. Mueller, Langnau, both of Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 1, 1981, Ser. No. 326,246
Claims priority, application European Pat. Off., Dec. 8, 1980, 80107706
Int. Cl.³ H04J 6/00
U.S. Cl. 375—89 5 Claims



1. Method of exchanging asynchronous data packets as well as synchronous data blocks in frames between stations attached to a unidirectional transmission ring, in which system a circulating frame header including first, second and third control bits is used for regulating access to the ring, which includes for each said station the steps of:

recognizing a circulating frame header, testing a first control bit (TK) in said header, and setting said first control bit to a first binary value (1) if the station has an asynchronous data packet to be transmitted, and transmitting said data packet if said first control bit had a second binary value (0), and releasing a new frame header including a first control bit having said given first binary value;

in each said station testing a second control bit (P1) in said frame header, and preventing issuance of a new frame header after transmission of said data packet if said second control bit had a first binary value (1); and in a particular circuit-switch monitor station:

issuing a timing signal at periodic intervals,

setting said second control bit to said first binary value in the next frame header received after each said periodic timing signal; and

issuing a frame header in which a third control bit (CS) is set to a first binary value (1) after receiving a frame end delimiter, characterized by the following additional steps in each said station:

testing said third control bit (CS) in each frame header,

preventing conversion of said first control bit (TK) and transmission of data if said station has only an asynchronous data packet to be transmitted and said third control bit (CS) had said first binary value (1),

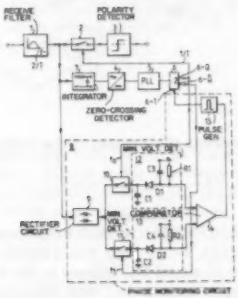
setting said first control bit (TK) to said first binary value (1) if said station has a synchronous data block to be transmitted and said third control bit (CS) had said first binary value (1), and

transmitting said synchronous data block if said first control bit (TK) had said second binary value (0), and releasing a new frame header including a first control bit (TK) having said secondary binary value (0) and a third control bit (CS) having said first binary value (1).

4,429,406
ARRANGEMENT FOR CHECKING THE SYNCHRONIZATION OF A RECEIVER

John M. Hale, RedHill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,346
Claims priority, application United Kingdom, Apr. 29, 1981, 8113287
Int. Cl.³ H04L 7/06
U.S. Cl. 375—113 3 Claims

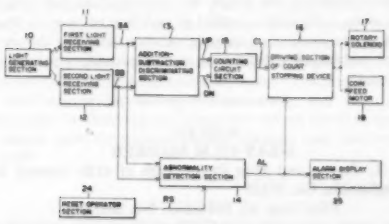


1. An arrangement for checking the synchronization of a receiver for data signals having a power-versus-frequency spectrum comprising two sidebands located one on each side of a symbol frequency, the received data signal being synchronously sampled in each symbol interval at first and second instants which are half-a-symbol interval apart characterised in that the arrangement comprises means for detecting the minimum value of the sampled signal at each of the two instants and means for generating a check signal whose value is dependent on whether the minimum levels over a number of cycles of the input data of the signal sampled at the first instant, is greater than that of the signal sampled at the second instant.

4,429,407
COUNTING CIRCUIT FOR COIN COUNTING DEVICE

Katsuske Furuya, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,604
Claims priority, application Japan, Jun. 27, 1980, 55-87579
Int. Cl.³ G07D 3/16
U.S. Cl. 377—7 2 Claims

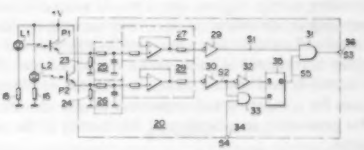


2. A counting circuit arrangement for a coin counting device, comprising a light generating section having a light emitting element, first and second light receiving sections respectively having first and second photosensors arranged closely adjacent to each other for receiving light from said light emitting element when they are not covered by any passing coins and for generating detection signals when they are covered by any of the passing coins, an addition-subtraction discriminating section for receiving output signals from said first and second light receiving sections to generate a count-up signal when the first light is received before the receipt of the second light and a count-down signal when the first light is received after the receipt of the second light, a counter section for receiving the signal from said addition-subtraction discriminating section to count the number of coins passing through said first and second photosensors, and an abnormality detection section connected in parallel with said addition-subtraction discriminating section to receive the output signals from said first and second light receiving sections and to produce an alarm signal in response to a predetermined difference in number of pulses between the output signals from said first light receiving section and the output signals from said second light receiving section, said abnormality detection section including a NAND gate for receiving said output signals from said first and second light receiving sections, a NOR gate for receiving said output signals from said first and second light receiving sections, an OR gate for receiving the output from said NOR gate and a reset signal from a reset operator section, a counter for receiving the output signal from said NAND gate and the output signal from said OR gate, and a set-reset flip-flop for receiving the output signal from said counter and reset signal to generate an alarm signal when a second output signal indicating occurrence of any abnormal condition is fed thereto by said counter.

4,429,408
DEVICE FOR PREVENTING FAULTY COUNTING OPERATIONS IN A PAPER SHEET COUNTER

Eikoh Hibari, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,482
Claims priority, application Japan, Jul. 8, 1980, 55-95927[U]
Int. Cl.³ B65H 3/12
U.S. Cl. 377—8 5 Claims



1. In a paper sheet counting apparatus comprising a holder for moving between a paper sheet depositing position and a paper sheet counting position, a rotating cylinder provided with a plurality of suction heads for sucking and turning over paper sheets one by one from said holder when the holder is moved to said paper sheet counting position, and counting means for counting the number of paper sheets sucked by said suction heads, the improvement comprising a device for preventing a faulty counting operation of the paper sheet, said device comprises a start sensor for detecting paper sheets loaded into said holder and for producing a first detection signal in response thereto, a paper sheet sensor for detecting the presence of said paper sheet in both said depositing position and said counting position and for producing a second detection signal in response thereto, and a control circuit for instructing the movement of the holder and counting operation to start, said control circuit receiving the detection signals from said start sensor and said paper sheet sensor and generating, upon reception of said detection signals, sequential instruction signals for starting one cycle of counting operation and for inhibiting subsequent instruction signals while the paper sheet sensor continues to detect the paper sheets.

4,429,409

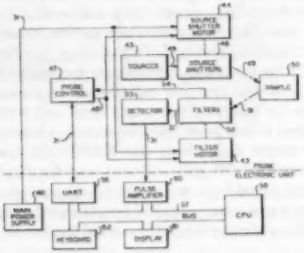
PORTABLE APPARATUS FOR ANALYZING METALS BY X-RAY FLUORESCENCE

Peter F. Berry; Wendell D. Miller, and John L. Nethery, Jr., all of Austin, Tex., assignors to Ramsey Engineering Company, St. Paul, Minn.

Continuation of Ser. No. 216,229, Dec. 15, 1980. This application Oct. 21, 1982, Ser. No. 435,854

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—45 **10 Claims**



1. In an apparatus for analyzing a sample of material by the X-ray fluorescence method having means responsive to X-ray radiation from the sample for generating a plurality of groups of sample signals each group representing the spectral lines and energy intensity in a predetermined one of a plurality of energy regions of a different element, an electronic unit comprising: first means for storing the groups of sample signals; second means for storing a plurality of groups of known signals, the known signals of each group representing the spectral lines and energy intensities in the plurality of predetermined energy regions of a different known material; means connected to said first and second means for storing for comparing the sample signals stored in said first means with the known signals in the corresponding energy regions stored in said second means and for generating an identification signal representing the identity of the sample of material when the sample signals stored in the first means correspond to said known signals of one of said groups stored in said second means; and means connected to said means for comparing and responsive to said identification signal for generating an indication of the identity of the sample of material.

4,429,410

APPARATUS AND METHOD FOR ASSESSING THE CONCENTRATION OF MINERAL MATTER IN COAL-DERIVED LIQUIDS

Anthony W. Jury, Beckford, and Geoffrey J. Pitt, Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

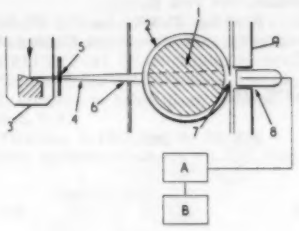
Filed Jan. 29, 1981, Ser. No. 229,470

Claims priority, application United Kingdom, Feb. 15, 1980, 805239

Int. Cl.³ G01N *23/06*

U.S. Cl. 378—53 **10 Claims**

1. A method for the assessment of mineral matter in the range 0 to 2% by weight in coal-derived liquids comprising passing an X-ray beam having as a predominant component wavelengths in the range 0.6 to 0.8 Angstrom units through



said liquid and detecting the intensity of the transmitted radiation.

4,429,411

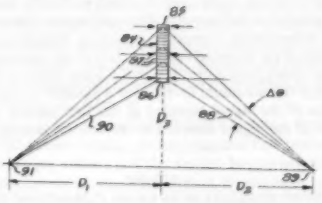
INSTRUMENT AND METHOD FOR FOCUSING X-RAYS, GAMMA RAYS AND NEUTRONS

Robert K. Smither, Hinsdale, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 255,974, Apr. 20, 1981, abandoned. This application Mar. 25, 1982, Ser. No. 362,172

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—84 **23 Claims**



1. A crystal diffraction instrument comprising means for diffracting a beam having an energy of above about 5 KeV, including a crystalline structure with a surface having a face for receiving the beam and atomic planar spacing along the face for diffracting the beam, the spacing changing progressively along a direction parallel to said face to provide Bragg angles of progressively changing values to increase the usable area of said face for diffraction and to provide a focusing of said beam.

4,429,412

X-RAY FILM MARKER

Larry L. Pierce, and June Pierce, both of 4120 Vansant Rd., Douglasville, Ga. 30135

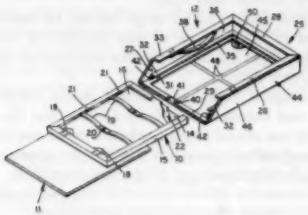
Filed Aug. 10, 1981, Ser. No. 291,780

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—165 **7 Claims**

1. An x-ray film marker comprising a film support means including a frame defining an x-ray permeable path, said film support means comprising a film cassette including a rectangular x-ray opaque border frame, a flat x-ray permeable support plate mounted in said border frame, an x-ray opaque door pivotably mounted to said border frame and normally positioned in parallel relationship with respect to said support plate whereby x-ray film is held between said door and said support plate in the x-ray permeable path, and indicia support means movably mounted to a corner of said border frame, at least two

indicia carried by said indicia support means and spaced from one another, said indicia being opaque to x-rays, with the indicia support means movable to position one indicia in the x-ray path in front of the x-ray film and the other indicia in



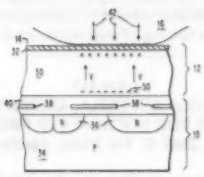
overlying relationship with the border frame whereby when unexposed film is placed in the film support means and is exposed to x-rays and later is developed, the film will have the image of one of the indicia imposed thereon.

4,429,413

FINGERPRINT SENSOR

David G. Edwards, Mount Laurel, N.J., assignor to Siemens Corporation, Iselin, N.J.

Filed Jul. 30, 1981, Ser. No. 288,288
Int. Cl.³ G06K *9/28*
U.S. Cl. 382—4 **19 Claims**



1. A fingerprint sensor for transforming the topological pattern of a finger under investigation into an electric output signal, comprising

(a) a contact body having a contact surface for receiving a contact pressure exercised by means of a finger and including a transducer element for transducing said topological pattern into a corresponding information pattern;

(b) an array of sensing cells disposed adjacent said transducer element, each cell including a first transistor having a gain, within an amplification range, dependent upon the most adjacent portion of said information pattern;

(c) means for setting the operating point of each of said first transistors within its amplification range; and

(d) means for deriving said electrical output signal in dependence upon the current passing through said first transistors.

4,429,414

PATTERN RECOGNITION SYSTEM OPERATING BY THE MULTIPLE SIMILARITY METHOD

Teruyoshi Asakawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

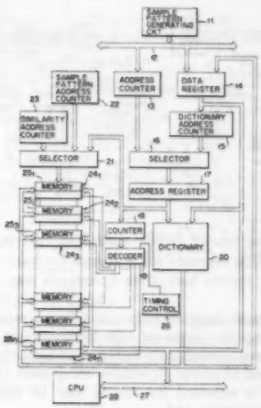
Filed Mar. 11, 1981, Ser. No. 242,567
Claims priority, application Japan, Mar. 13, 1980, 55-31861
Int. Cl.³ G06K *9/62*
U.S. Cl. 382—30 **7 Claims**

1. A pattern recognition system comprising:

a sample pattern generating circuit for sequentially generating, one by one, a plurality of sample pattern data corresponding to a plurality of sample patterns, respectively, each of said sample pattern data having a plurality of bit rows;

a dictionary memory which stores a plurality of reference pattern data comprising pieces of data each representing one of a plurality of reference patterns, respectively, each of said reference pattern data having a plurality of bit rows;

a plurality of pattern similarity computation circuits, each including a memory section and a computation section and being connected to said sample pattern generating circuit and said dictionary memory; and



means for transferring the sample pattern data to the respective memory sections of said pattern similarity computation circuits to store the sample pattern data in the respective memory sections and for transferring the reference pattern data to said computation sections one piece at a time;

said computation sections of said pattern similarity computation circuits simultaneously calculating the degrees of similarity of pattern data in said memory sections, with respect to said one piece of the reference pattern data.

4,429,415

SIGNAL-SEEKING TUNING SYSTEM WITH SIGNAL LOSS PROTECTION FOR A TELEVISION RECEIVER

Danny Chin, Plainsboro; John G. N. Henderson, Princeton, and Robert J. Maturo, Bricktown, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,171
Int. Cl.³ H04B *1/26*; H03J *7/22, 7/28*
U.S. Cl. 455—164 **10 Claims**

10. A signal-seeking tuning system for scanning at least one radio frequency (RF) signal band which includes a plurality of channels in which RF signals may be present, for selecting present ones of said RF signals, which tuning system comprises:

tuning means, responsive to a tuning signal for selecting and heterodyning a present one of said RF signals to produce an IF signal having a nominal frequency;

signal processing means receiving said IF signals, and including means for applying a control signal to said tuning means to fine tune said IF signal to said nominal frequency;

a source of clock signals;

means for selectively developing a scan signal;

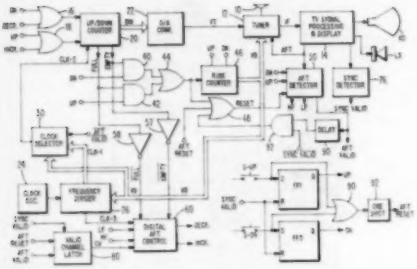
digital counter means for generating a binary word having minimum and maximum values, said binary word changing in value in a predetermined sense in response to said clock signal and said scan signal being applied to said

counter means, said binary word changing cyclically between said minimum and said maximum values;

converting means coupled to said counter means for developing said tuning signal responsive to said binary word;

detecting means responsive to said signal processing means and coupled to said counter means for stopping said counter means from changing the value of said binary word when said IF signal has a predetermined condition;

correction means coupled between said detecting means and said counter means for thereafter decrementing the value of said binary word when said control signal exceeds a



predetermined range of values in a first direction and for incrementing the value of said binary word when said control signal exceeds said range in an opposite direction, said first and opposite directions being such that the tuning signal is adjusted for tuning said IF signal to said nominal frequency; and

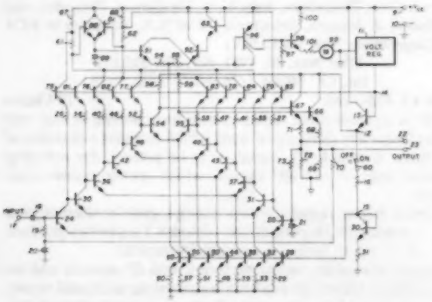
inhibiting means to which said detecting means is coupled for inhibiting said correction means from changing said binary word whenever said selected present RF signal is lost at a time subsequent to said predetermined condition having been detected by said detecting means.

4,429,416

MULTISTAGE CASCADE/CASCODE LIMITING IF AMPLIFIER AND METER CIRCUIT

Ronald W. Page, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 26, 1982, Ser. No. 362,363
Int. Cl.³ H04B 1/26; H03F 3/45
U.S. Cl. 455—211 **5 Claims**



1. An integrated signal amplifier and signal level indicating circuit suitable for use in an FM radio receiver as a limiting IF amplifier and meter driver wherein the signal level indication is independent of the amplifier limiting function, said circuit having a signal input, a differential signal output and a signal level related current output and comprising:

a plurality of directly coupled cascaded differential amplifier stages, each stage including a source of tail current and a pair of load resistors;

means for coupling an input signal to one of input terminals of the first one of said plurality of differential amplifier stages to provide said input;

a differential output buffer stage having an input directly coupled to the last one of said plurality of differential amplifier stages and an output that will provide said differential signal output;

directly coupled negative feedback means connected between said output of said output buffer and the input of said first one of said plurality of differential amplifiers, said negative feedback acting to stabilize the operating biases on all of said plurality of differential amplifiers;

cascode connected differential amplifying means coupled to the early stages of said plurality of differential amplifier stages by way of said load resistors so that a majority thereof are so coupled, said cascode connected differential amplifying means having a differential common output and a plurality of differential inputs individually directly coupled to selected ones of said differential amplifier load resistors;

a differential peak detector having an input directly coupled to said common output of said cascode connected differential amplifier means and a single-ended output that develops a direct current voltage level related to the peak signal level at said input; and

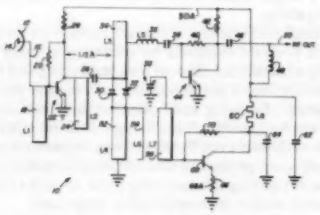
a differential meter amplifier having a pair of differential inputs and a current output, wherein one of said inputs is directly coupled to said output of said differential peak detector and the other input is returned to a source of reference potential whereby said current output rises in proportion to the log of said signal level.

4,429,417

INTEGRATED ANTENNA, AMPLIFIER AND CONVERTER FOR MICROWAVE FREQUENCIES

George M. Yool, 2060 S. Val Vista, Apache Junction, Ariz. 85220

Filed Jul. 7, 1980, Ser. No. 166,595
Int. Cl.³ H04B 1/22
U.S. Cl. 455—291 **7 Claims**



1. A microwave amplifier and frequency down converter system, comprising:

an antenna;

first means coupled proximate said antenna for directing microwave energy to said antenna; and

an integrated amplification and converter circuit means connected to said antenna for converting said microwave energy to RF energy, said first means comprises:

a resonant cavity; and

a reflector for concentrating said microwave energy at the mouth of said resonant cavity,

said antenna is mounted within said resonant cavity at a point of maximum voltage,

said integrated circuit means is on a printed circuit board which is mechanically coupled proximate said resonant cavity, said antenna extending through said resonant cavity

for electrical coupling to said printed circuit board, said circuit means comprises:

a first amplifier having an output tuned to the frequency of an input signal received by said antenna;

a high frequency oscillator; and

second means coupled to said first amplifier and said oscillator for mixing outputs thereof to produce a first signal having a frequency substantially equal to the difference in frequency between said outputs, the output of said first amplifier is tuned to the frequency of the input signal by a first eighth-wave open-ended strip line on said printed circuit board.

4,429,418

FREQUENCY AGILE SATELLITE RECEIVER

Robert L. Hooper, Ocala, Fla., assignor to Microdyne Corporation, Ocala, Fla.

Filed Jul. 11, 1980, Ser. No. 168,667

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—314 **10 Claims**

1. A frequency agile receiver having a tunable voltage controlled oscillator operating in a range permitting use of conventional printed circuit boards and standard active and passive components mounted thereon, comprising

means for multiplying the frequency of the output signal from said oscillator to produce a frequency multiplied output signal,

a first mixer

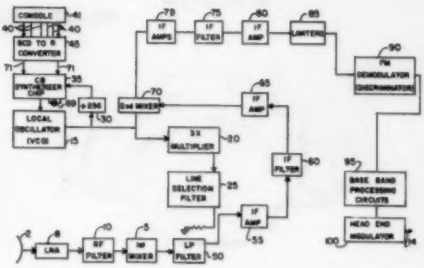
means for applying said frequency multiplied output signal and an information modulated received signal to said first mixer,

the frequency of said frequency multiplied output signal being less than the frequency of said received signal to produce first signals of the sum and difference frequencies of said received signals and said frequency multiplied output signal,

said first mixer being a dual diode subharmonic mixer whereby said frequency multiplied output signal is further multiplied in said first mixer by a factor of two,

a second mixer,

means for applying said frequency multiplied output signal



and said first difference signal to said second mixer to produce second signals at the sum and difference frequencies of said frequency multiplied output signal and said first difference signal,

said frequency multiplied output signal having a frequency less than said first difference signal, and

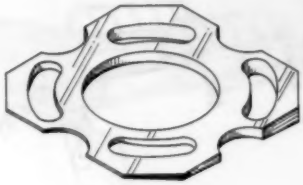
means for selecting said difference signal to said second signals.

272,389
APRON
Marilyn A. Meade, 140 Oneida St., Apartment #2, Pittsburgh, Pa. 15211
Filed Aug. 6, 1980, Ser. No. 175,731
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—227

272,390
CLEATED SHOE SOLE
Roberto Muller-Feigelstock, Scarsdale, N.Y., assignor to Pony International, Inc., Secaucus, N.J.
Filed Nov. 20, 1981, Ser. No. 323,201
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

272,391
LUGGAGE CASE
Michael Davis, New Castle, Pa., and Oleg Cassini, New York, N.Y., assignors to Airway Industries, Inc., Ellwood City, Pa.
Filed Feb. 3, 1982, Ser. No. 345,023
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

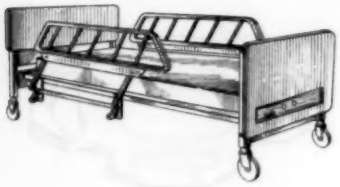
272,392
SHIM FOR FRONT WHEEL DRIVE VEHICLE
Frank S. Bigelow, 9240 Yellowstone Rd., Longmont, Colo. 80501
Filed May 24, 1982, Ser. No. 381,352
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—354



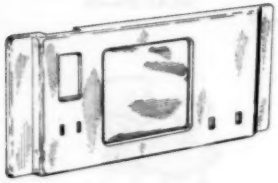
272,393
CHAIR
Hans V. Klier, Milan, Italy, assignor to Olivetti Synthesis, S.p.A., Turin, Italy
Filed Oct. 1, 1980, Ser. No. 192,679
Claims priority, application Italy, Apr. 2, 1980, 53089/80[U]
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

272,394
CHAIR
Hector M. Coronado, 2209 Via Cerritos, Palos Verdes Estates, Calif. 90274
Filed May 11, 1981, Ser. No. 262,531
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

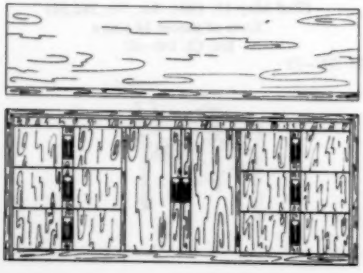
272,395
HOSPITAL BED
Richard Sonder, and Joseph L. Russo, both of New York, N.Y., assignors to Thonet Industries, Inc., York, Pa.
Continuation of Ser. No. 102,590, Dec. 12, 1979. This application Jul. 2, 1982, Ser. No. 394,664
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83



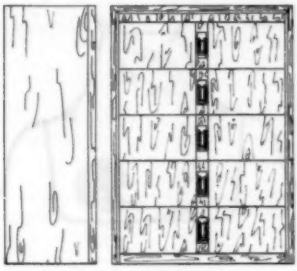
272,396
SHOWER RACK
Rick A. Nestor, 3052 Clairemont Dr. #D, San Diego, Calif. 92117
Filed Sep. 19, 1980, Ser. No. 183,199
Term of patent 14 years
Int. Cl. D23—*02*; D6—*06, 07*
U.S. Cl. D6—86



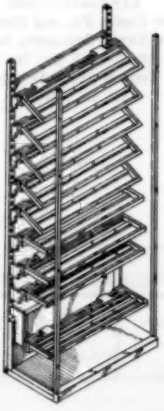
272,397
DRESSER
Haywood L. West, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Dec. 16, 1981, Ser. No. 331,319
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—164



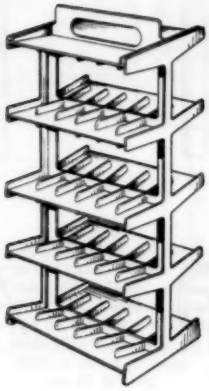
272,398
CHEST OF DRAWERS
Haywood L. West, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Dec. 16, 1981, Ser. No. 331,320
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—165



272,399
DISPLAY UNIT
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,182
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



272,400
DISPLAY STAND
Hanns Persch, Bodenheim, Fed. Rep. of Germany, assignor to Firma Kuemmerling GmbH, Fed. Rep. of Germany
Filed Jul. 1, 1981, Ser. No. 279,563
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—188

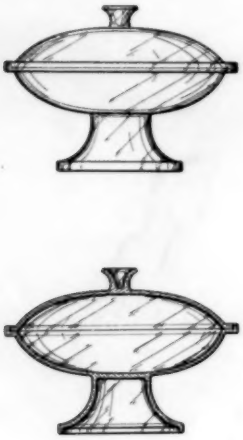


272,401
DISPLAY SHELF
William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Dec. 2, 1981, Ser. No. 326,811
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

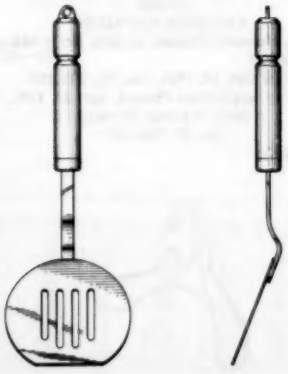
272,402
TRAY UNIT FOR MOUNTING ON THE BACKREST OF AN AIRCRAFT SEAT
Ralph G. Marrujo, Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.
Filed Jul. 17, 1981, Ser. No. 284,519
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—199

272,403
CLOTHES HANGER
Heikki Tavela, Helsinki, Finland, assignor to Oy MK-tuote Ab, Helsinki, Finland
Filed Oct. 14, 1981, Ser. No. 311,310
Claims priority, application Finland, Apr. 23, 1981, 304/81
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

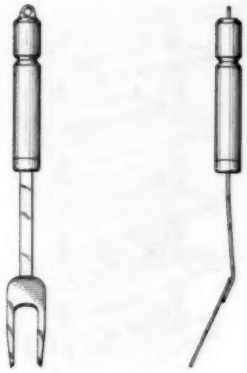
272,404
CASSEROLE
Nicholas P. Angelakos, Staten Island, N.Y., assignor to Lancaster Colony Corporation, New York, N.Y.
Filed Aug. 27, 1981, Ser. No. 296,682
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17



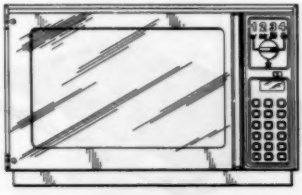
272,405
ROUND TURNER
Fred S. Steiner, 154 Combs Ave., Woodmere, N.Y. 11598
Filed May 21, 1981, Ser. No. 265,830
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—102



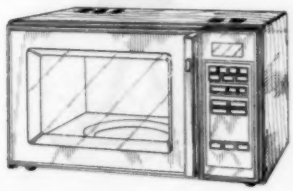
272,406
FORK
Fred S. Steiner, 154 Combs Ave., Woodmere, N.Y. 11598
Filed May 21, 1981, Ser. No. 265,815
Term of patent 14 years
Int. Cl. D07—*04, 03*
U.S. Cl. D7—106



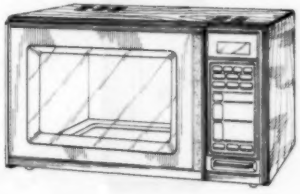
272,407
CONVECTION OVEN
Rex Notbohm, Boone County, Mo., assignor to Toastmaster Inc., Columbia, Mo.
Filed Nov. 20, 1981, Ser. No. 323,493
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—350



272,408
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Michio Tanaka, and Toshio Harada, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 19, 1981, Ser. No. 294,089
Claims priority, application Japan, Feb. 20, 1981, 56-6720
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—351

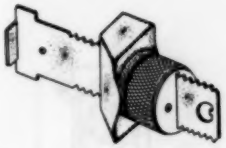


272,409
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Michio Tanaka, and Toshio Harada, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan
Filed Aug. 19, 1981, Ser. No. 294,090
Claims priority, application Japan, Sep. 20, 1981, 56-6723
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—351



272,410
SCISSORS
Ch'eng-Ch'uan Huang, No. 33-12, Ch'iao-Tou La., Ch'iao-Tou Villiage, Fu-Hsing Hsiang, Chan-Hua County, Taiwan
Filed Dec. 29, 1981, Ser. No. 335,354
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—55

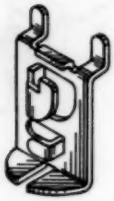
272,411
PORTABLE DOOR LOCK
Roman S. Yarosz, 725 Dutton Ave., San Leandro, Calif. 94577
Filed Mar. 2, 1981, Ser. No. 239,362
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



272,412
BICYCLE LOCK HOLDER
Donald J. Shanklin, 1652 N. Mountain View Pl., Fullerton, Calif. 92631
Filed Feb. 17, 1981, Ser. No. 235,125
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D8—343

272,413
REVERSIBLE LOCK GUARD
Thomas F. Hennessy, Bristol, Conn., assignor to Lori Corporation, Southington, Conn.
Filed Nov. 6, 1981, Ser. No. 318,731
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—343

272,414
HANGER BRACKET FOR USE WITH A PERFORATED PANEL
Richard D. Barnes, Rockford, Ill., assignor to Southern Imperial, Inc., Tupelo, Miss.
Filed Jun. 25, 1981, Ser. No. 277,200
Term of patent 14 years
Int. Cl. D8—*08;* D6—*06*
U.S. Cl. D8—363



272,415
PAINTER'S POT HOOK
Gerald L. Case, Rte. 1, Box 91, Brighton, Mo. 65617
Filed Jun. 25, 1981, Ser. No. 277,081
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

272,416
CASTOR
Stafford T. Screen, Stourbridge, England, assignor to British Castors Limited, West Bromwich, England
Filed Dec. 15, 1980, Ser. No. 217,517
Claims priority, application United Kingdom, Jun. 14, 1980, 995,305
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08, 09*
U.S. Cl. D8—375

272,417
BOTTLE OR SIMILAR ARTICLE
Camille Ziccardi, 1831 W. Eddy St., Chicago, Ill. 60657
Filed May 4, 1981, Ser. No. 259,990
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—354

272,418
CAN
Robert J. Gruodis, Oak Lawn; William T. Franz, Palos Park, and Edward J. Hayes, Elmhurst, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.
Filed Jun. 5, 1981, Ser. No. 271,052
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—370

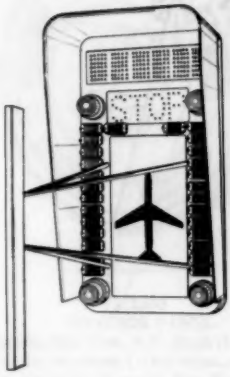
272,419
DISPENSING CONTAINER OR THE LIKE
Hanns Persch, Bodenheim, Fed. Rep. of Germany, assignor to Firma Kuemmerling GmbH, Fed. Rep. of Germany
Filed Jul. 1, 1981, Ser. No. 279,577
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—413

272,420
STORAGE CONTAINER FOR NOVELTY ITEMS OR THE LIKE
Stanley R. Shaland, Hartsdale, N.Y., assignor to Lurie Import, Ltd., New York, N.Y.
Filed May 15, 1981, Ser. No. 263,894
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424

272,421
COMBINED SURGICAL RULER AND PEN OR THE LIKE
Dan Sandel, 8111 Amigo Ave., Northridge, Calif. 91324
Filed Jan. 29, 1981, Ser. No. 229,556
The portion of the term of this patent subsequent to Jun. 8, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*04*; D24—*99*
U.S. Cl. D10—71

272,422
CONTROL PANEL FOR MUSICAL CAR HORNS OR THE LIKE
Sayre Swarztrauber, 301 E. 79th St., New York, N.Y. 10021, and Marc H. Segan, 154 W. 70th St., New York, N.Y. 10023
Filed May 19, 1981, Ser. No. 265,251
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D10—106

272,423
AIRCRAFT DOCKING DISPLAY
Nils-Eric Anderberg, Västratorp 589, S-231 00 Trelleborg, Sweden
Filed Jul. 31, 1981, Ser. No. 288,682
Claims priority, application Sweden, Feb. 5, 1981, 81-0259
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—114

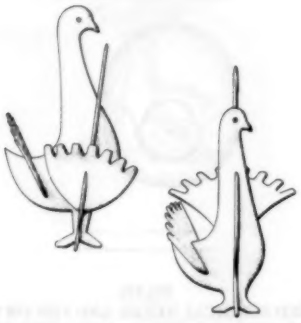


272,424
MOTORCYCLE EMBLEM OR THE LIKE
Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed May 26, 1982, Ser. No. 382,081
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D11—107

272,425
NOVELTY CHRISTMAS DECORATION
Franklin Carroll, Guelph, Canada, assignor to Carroll Company, Guelph, Canada
Filed Mar. 30, 1982, Ser. No. 363,535
Term of patent 14 years
Int. Cl. D11—*02, 05*
U.S. Cl. D11—125

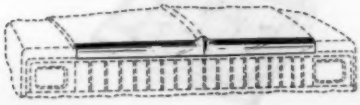
272,426
TABLE ORNAMENT
Doreen N. Roberts, Gwynedd, Wales, assignor to Pendelfin Studios Limited, Lancashire, England
Filed Nov. 19, 1981, Ser. No. 322,835
Claims priority, application United Kingdom, Oct. 2, 1981, 1002814
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

272,427
DOVE SCULPTURE
Guy Moyet, St. Ismier Biviers les Barraux, France, assignor to Moyet Perrin, Pontcharra, France
Filed May 10, 1982, Ser. No. 376,601
Claims priority, application France, Nov. 9, 1981, 813,847
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162



272,428
SADDLE BAG COOLER
Michael O. Kelley, De Soto, Tex., assignor to Country Blues, Incorporated, Duncanville, Tex.
Filed Aug. 10, 1981, Ser. No. 291,169
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

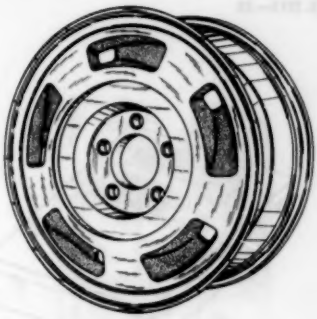
272,429
TRIM PIECE FOR AN AUTOMOBILE HOOD
Ulric W. Trombley, R.R. #1, Chisago City, Minn. 55013, and Richard J. Nozel, 354 Edith Dr., West St. Paul, Minn. 55118
Filed Apr. 27, 1981, Ser. No. 257,776
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—190



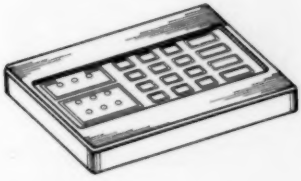
272,430
STEP PLATE
Ronald A. Minichillo, and Wayne R. Broyles, both of Elkhart, Ind., assignors to Kemberly, Inc., Elkhart, Ind.
Filed Jan. 28, 1982, Ser. No. 343,437
Term of patent 14 years
Int. Cl. D12—*16*; D25—*02*
U.S. Cl. D12—203

272,431
VEHICLE WHEEL
Raymond J. Hedlund, Concord, Calif., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Sep. 25, 1981, Ser. No. 305,569
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

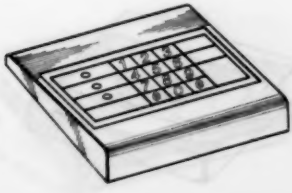
272,432
VEHICLE WHEEL
Raymond J. Hedlund, Concord, Calif., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Sep. 25, 1981, Ser. No. 305,746
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



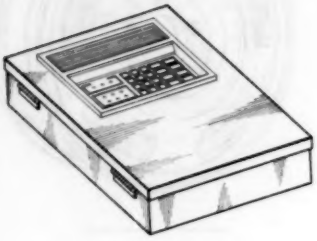
272,433
CONTROL PANEL
Beth A. Trabucchi, New York, N.Y.; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,108
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



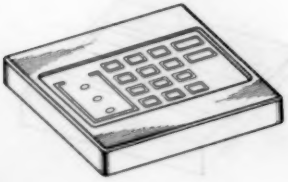
272,434
CONTROL PANEL
H. Patrick Thornton, Acton; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, all of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,122
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



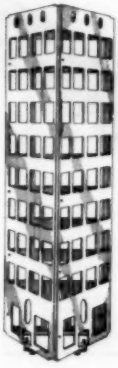
272,435
CONTROL PANEL
H. Patrick Thornton, Acton, Mass.; Beth A. Trabucchi, New York, N.Y.; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,124
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



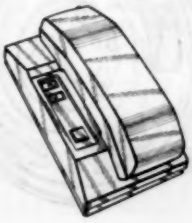
272,436
CONTROL PANEL
Beth A. Trabucchi, New York, N.Y.; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,125
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



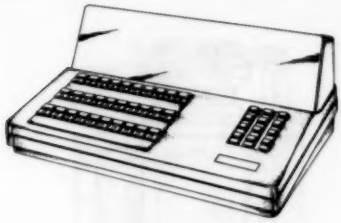
272,437
TELEPHONIC EQUIPMENT DISTRIBUTION PANEL STAND
Robert H. Knickerbocker, Chesire, and Karl-Heinz Pohl, Woodbury, both of Conn., assignors to The Siemon Company, Watertown, Conn.
Filed May 28, 1981, Ser. No. 268,013
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52



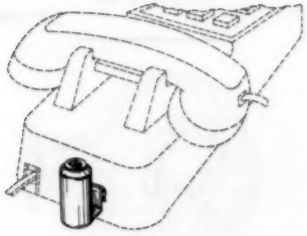
272,438
COMBINED TELEPHONE HANDSET AND BASE STATION THEREFOR
John C. Coons, and Jean M. Beirise, both of Cincinnati, Ohio, assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed May 1, 1981, Ser. No. 259,604
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



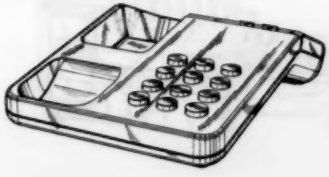
272,439
PABX CONSOLE
J. Scott Gibson, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Filed Jun. 22, 1981, Ser. No. 276,429
Claims priority, application Canada, Jan. 23, 1981, 23-01-81-8
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



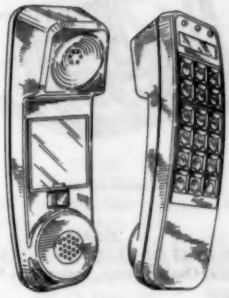
272,440
CLIP ON DEVICE FOR LOCKING TOUCH TONE TELEPHONES
Woodrow T. Morrow, Mesa, Ariz., assignor to Woodmar Company, Dewey, Ariz.
Filed Jun. 11, 1981, Ser. No. 272,492
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



272,441
TELEPHONE INSTRUMENT BODY
Peter B. Carr, Harpenden, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 2, 1981, Ser. No. 239,733
Claims priority, application United Kingdom, Aug. 28, 1980, 80/996340
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



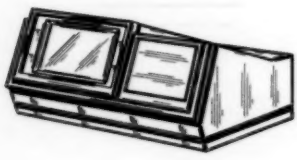
272,442
TELEPHONE HANDSET
Peter D. H. Trussler, Ottawa, Canada, assignor to International Systcoms Limited, Etobicoke, Canada
Filed Jul. 20, 1981, Ser. No. 285,403
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63



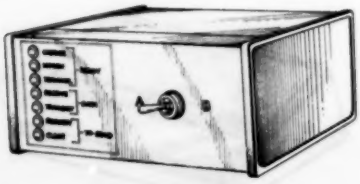
272,443
FAMILY PAGER TRANSMITTER DEVICE OR SIMILAR ARTICLE
Ka W. Wong, Ngau Tau Kok, China, and Albert K. H. Au, Wanchai, Hong Kong, assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 30, 1981, Ser. No. 335,965
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—95

272,444
WORD PROCESSOR
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 20, 1981, Ser. No. 294,423
Claims priority, application Japan, Feb. 24, 1981, 56-7573
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

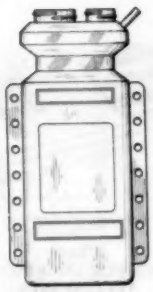
272,445
MAIN UNIT OF ELECTRONIC COMPUTER
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 20, 1981, Ser. No. 294,426
Claims priority, application Japan, Feb. 24, 1981, 56-7576
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



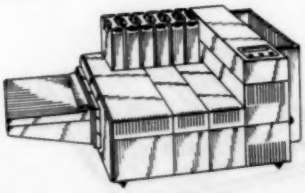
272,446
DIGITAL TRANSFER SWITCH WITH DIAGNOSTIC DISPLAY
Michael J. Dellecave, 3754 St. Johns Ter., Cincinnati, Ohio 45236, and Jack L. Klosterman, Sr., 1575 Claretta Dr., Cincinnati, Ohio 45231
Filed Jun. 8, 1981, Ser. No. 271,816
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D14—107



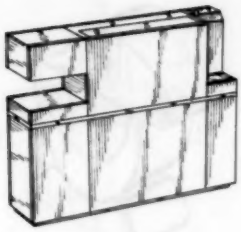
272,447
CONTAINER FOR OCTANE BOOSTER FLUID FOR INTERNAL COMBUSTION ENGINES
Mike J. Ashmore, Broken Arrow, Okla., assignor to Atlas Investment Co., Oklahoma City, Okla.
Filed Jul. 28, 1981, Ser. No. 287,573
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—5



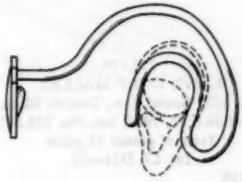
272,448
X-RAY-FILM-PROCESSOR
Norbert Schlagbeck, Fuerstenfeldbruck, and Lutz Rabold, Söcking, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 12, 1980, Ser. No. 216,606
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 5MR587-G175805
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—34



272,449
X-RAY-FILM-PROCESSOR
Norbert Schlagheck, Fuerstenfeldbruck, and Lutz Rabold, Söcking, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 12, 1980, Ser. No. 216,607
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 5MR587-G175806
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—34



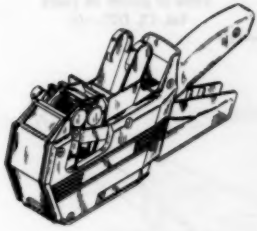
272,450
EYEGLASSES
Edward M. Strieber, 5400 Highland Crest Dr., Austin, Tex. 78731
Filed Jul. 13, 1981, Ser. No. 282,386
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—102



272,451
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Nov. 6, 1981, Ser. No. 318,794
Claims priority, application Hague, May 8, 1981, 71414
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—117

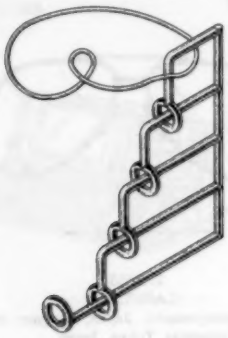
272,452
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Nov. 6, 1981, Ser. No. 318,796
Claims priority, application Switzerland, May 8, 1981, 71414
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—117

272,453
LABELER
Tokio Wada, Nagareyamashi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan
Filed Nov. 9, 1981, Ser. No. 319,873
Claims priority, application Japan, May 30, 1981, 56-23094
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—19

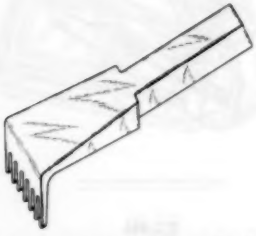


272,454
TOY STACKABLE BOLT AND NUT ASSEMBLY
Mark D. Boudreaux, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Sep. 18, 1981, Ser. No. 303,446
Term of patent 14 years
Int. Cl. D21—*01;* D8—*08*
U.S. Cl. D21—59

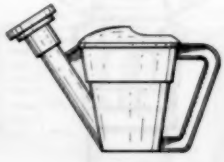
272,455
WIRE PUZZLE OR SIMILAR ARTICLE
Jesse W. Eakin, Box 210, Rea, Pa. 15356
Filed Jun. 22, 1981, Ser. No. 275,675
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—106



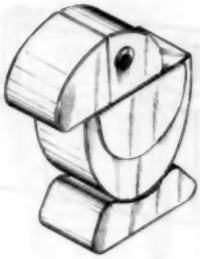
272,456
TOY RAKE
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 21, 1981, Ser. No. 332,451
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



272,457
TOY WATERING BUCKET
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 21, 1981, Ser. No. 332,453
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120

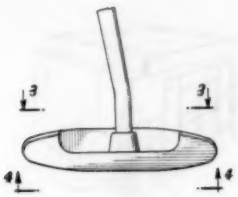


272,458
MOVEABLE TOY BIRD
Irwin Fleminger, 565 First St., Brooklyn, N.Y. 11215
Filed Nov. 20, 1981, Ser. No. 323,461
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—160

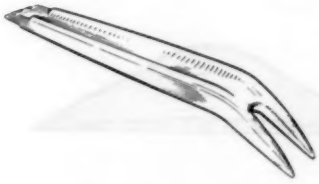


272,459
LAWN GOLF MALLET
Robert C. Jones, 8427 Grand Ave., Duluth, Minn. 55808
Filed Jan. 11, 1982, Ser. No. 338,307
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—210

272,460
PUTTER HEAD WITH BOWED SHAFT
Alexander S. O. MacDougall, 495 Valley Club Rd., Santa Barbara, Calif. 93108
Filed Oct. 16, 1981, Ser. No. 312,308
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217



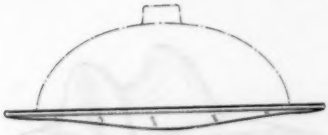
272,461
GOLFER'S TOOL
Patrick C. Burns, Clifton Hill, Australia, assignor to P. C. Burns Pty. Limited, Clifton Hill, Australia
Filed Dec. 28, 1981, Ser. No. 334,523
Claims priority, application Australia, Jun. 30, 1981, 84,505
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—234



272,462
TELESCOPING FISHING POLE
Lloyd J. LeRoue, 726 S. 12th St., Yakima, Wash. 98901
Filed Apr. 9, 1981, Ser. No. 252,396
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

272,463
FISHING LURE
C. Paul Haven, Owensboro, Ky., assignor to Nationwide Lure Manufacturing Co., Inc., Beaver Dam, Ky.
Filed Jan. 27, 1982, Ser. No. 343,383
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

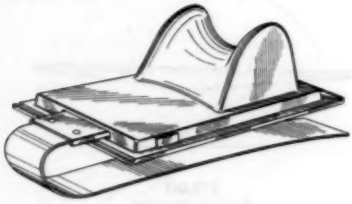
272,464
TOP FOR A LAVATORY OR SIMILAR ARTICLE
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Continuation-in-part of Ser. No. Des. 182,272, Aug. 28, 1980, abandoned. This application Nov. 17, 1981, Ser. No. 322,102
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



272,465
FALSE TOOTH
Ehrenfried G. B. Wolf, 828 Lincoln Creek Rd., Centralia, Wash. 98531
Filed Jan. 26, 1981, Ser. No. 228,380
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

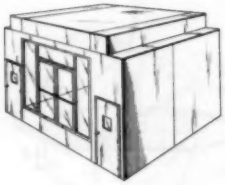
272,466
MULTI-PROJECTION MULTI-HOLE ROLLER FOR MASSAGING AND CHIROPRACTIC THERAPY
Teruo Masuda, Itsukaichi, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Oct. 14, 1981, Ser. No. 311,325
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36

272,467
CERVICAL TRACTION UNIT
Frank J. Nightingale, 3791 32nd St., San Diego, Calif. 92104
Filed Jun. 8, 1981, Ser. No. 271,597
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



272,468
PROSTHETIC VALVE KEY
Timothy D. Bulgarelli, Pasadena, and John L. Stonecipher, Sierra Madre, both of Calif., assignors to United States Manufacturing Company, Pasadena, Calif.
Filed Jun. 15, 1981, Ser. No. 273,761
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

272,469
CLEAN ROOM
Maurice L. Burleson, La Palma, Calif., assignor to Burleson Airology Corporation, Orange, Calif.
Filed Nov. 2, 1981, Ser. No. 317,259
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—1



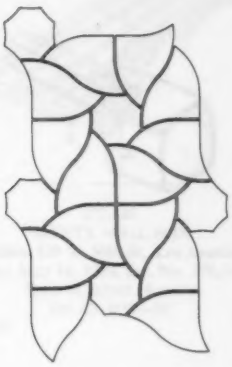
272,470
AIR SUPPORTED STRUCTURE
Michael A. Thompson, 23459 Wilson, Dearborn, Mich. 48124
Filed Dec. 30, 1981, Ser. No. 336,029
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—18

272,471
MOLDING
Michael D. Fisher, Mooreland, Ind., assignor to American Standard Inc., New York, N.Y.
Filed Jun. 2, 1981, Ser. No. 269,175
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

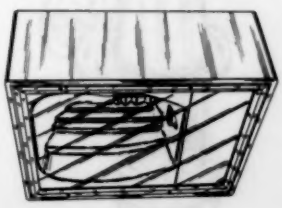
272,472
MOLDING
Thomas S. Flowers, New Castle, Ind., assignor to American Standard Inc., New York, N.Y.
Filed Jun. 2, 1981, Ser. No. 269,177
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

272,473
PILE SHOE
Erik Larsson, Oxelösund, Sweden, assignor to Aktiebolaget Gustavsberg, Gustavsberg, Sweden
Filed Oct. 21, 1981, Ser. No. 313,683
Claims priority, application Sweden, Apr. 29, 1981, 81-1055
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

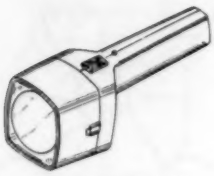
272,474
CERAMIC TILE UNIT
Maria L. Belgiojoso, Milan, Italy, assignor to Villeroy & Boch Keramische Werke KG, Mettlach, Fed. Rep. of Germany
Filed Jan. 7, 1981, Ser. No. 223,213
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 7 AR 153/80
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



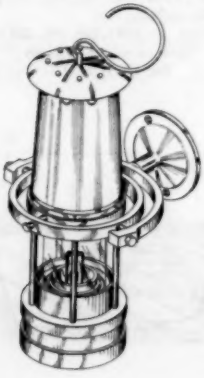
272,475
LUMINAIRE
Theodor G. Yahraus, Crawfordsville, Ind., assignor to National Service Industries, Atlanta, Ga.
Filed Jul. 20, 1981, Ser. No. 284,619
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—24



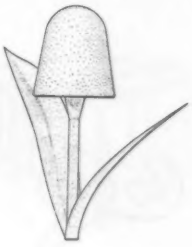
272,476
FLASHLIGHT OR SIMILAR ARTICLE
Don R. McCloskey, Trappe, Md.; Morris G. Grossman, Wyckoff, N.J.; Richard M. Joffe, Nutley, N.J., and Michael P. Ballone, New Providence, N.J., assignors to Black & Decker Inc., Newark, Del.
Filed Jul. 10, 1981, Ser. No. 282,025
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—46



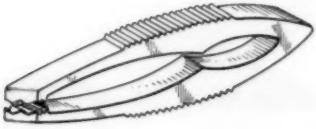
272,477
TRUE GIMBALED MINER'S LAMP
Richard A. Schuler, Streetroad, Ticonderoga, N.Y. 12883
Filed Mar. 9, 1981, Ser. No. 242,068
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—87



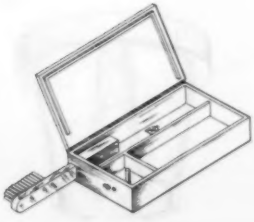
272,478
LAMP FIXTURE
Frederick L. Stohl, R.R. 2, Box 54, Califon, N.J. 07830
Division of Ser. No. 112,790, Jan. 16, 1980, Pat. No. Des. 264,255. This application Jan. 29, 1982, Ser. No. 370,571
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—101



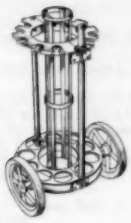
272,479
TWEEZERS OR SIMILAR ARTICLE
Harry Van Roeyen, and Paul E. Wagner, both of Skokie, Ill., assignors to Barnard Daleiden and David Daleiden, both of Chicago, Ill.
Filed Jun. 16, 1982, Ser. No. 388,911
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—55



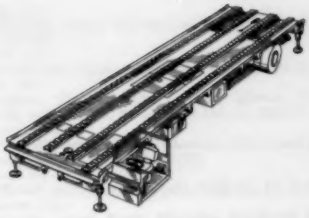
272,480
COMPACT
LeRoy Washington, Jr., 143 Ironwood Cir., Sierra Vista, Ariz. 85635
Filed Jul. 13, 1981, Ser. No. 283,073
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—78



272,481
COMBINED MOBILE STORAGE CART AND RACK
Bruce G. Balling, 10909 Walnutwood Way, Rancho Cordova, Calif. 95670
Filed Jun. 10, 1981, Ser. No. 272,299
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24



272,482
AIR CARGO LOADING VEHICLE
Wouter Verschoor, Elizabeth South, Australia, assignor to Static General Engineering Co. Pty. Ltd., Elizabeth South, Australia
Filed Nov. 15, 1979, Ser. No. 94,862
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—34



272,483
SAFETY MAIL BOX
William E. Franklin, 429 W. 54th St., Los Angeles, Calif. 90037
Filed May 14, 1982, Ser. No. 378,145
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—33

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.O. Arkitektkontor AB: *See*—
Lagher, Gunnar H., 4,428,118, Cl. 30-92.000.

A/S Kongsberg Vapenfabrikk: *See*—
Mowill, Rolf J., 4,428,714, Cl. 415-161.000.

Aario, Matti I.: *See*—
Maijala, Ari A. M.; and Aario, Matti I., 4,428,534, Cl. 241-18.000.

AB Nils Darje: *See*—
Strandberg, Anders, 4,428,410, Cl. 144-361.000.

Abatjoglou, Anthony G.; and Kapicak, Louis A., to Union Carbide Corporation. Process for preparing organic tertiary polyphosphine monooxides. 4,429,161, Cl. 568-14.000.

Abbott, Barry J.; and Silcox, William H., to Chevron Research Company. Sliding tension leg tower with pile base. 4,428,702, Cl. 405-202.000.

Abbott, Bruce A.; and Cohen, John M. Pipe belling apparatus. 4,428,722, Cl. 425-150.000.

Abbott, Johnnie G.; and Brown, Ralph V., to General Dynamics Corporation. Bearing staking tool and method. 4,428,105, Cl. 29-149.50B.

Abe, Ryuzo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,429,335, Cl. 358-342.000.

Abel, Donald, to Morton Glass Works. Glass breaking tool. 4,428,518, Cl. 225-103.000.

Abex Corporation: *See*—
Frank, Earl E.; and Yee, Bing S., 4,428,552, Cl. 246-393.000.

Aboelfotoh, Mohamed O., to International Business Machines Corporation. Color plasma display device. 4,429,303, Cl. 340-701.000.

Abrams, Burton S.: *See*—
Zeger, Andrew E.; Abrams, Burton S.; Rose, Joseph L.; Avioli, Michael J., Jr.; and Singh, Gurvinder P., 4,428,237, Cl. 73-592.000.

Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Noller, Christoph, to Daimler-Benz Aktiengesellschaft. Internal combustion engine. 4,428,347, Cl. 123-453.000.

AC&R Components, Inc.: *See*—
Krause, Richard J., 4,428,208, Cl. 62-192.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H., 4,428,585, Cl. 277-12.000.

Ackeret, Peter. Container for tape cassettes. 4,428,480, Cl. 206-387.000.

Acree, Elick H.; and Peeples, Walter P., Jr., to Gulf Nuclear, Inc. Method of forming encapsulated depleted uranium oil field tubular member. 4,428,108, Cl. 29-455.00R.

Acs, Tibor: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Keve, Tibor; Dancsi, Lajos; Galambos, Janos; Vezekenyi, Ferenc; and Acs, Tibor, 4,429,129, Cl. 546-70.000.

Acurex Solar Corporation: *See*—
Prideaux, Daniel L.; and Spencer, Robert M., 4,429,178, Cl. 136-246.000.

Adam, Rolf: *See*—
Heimbach, Klaus J.; Munz, Wolf-Dieter; Adam, Rolf; and Wenzl, Heinz, 4,428,809, Cl. 204-192.00P.

Adams, Milton R.: *See*—
Stokes, Richard F.; Timm, James D.; LaCroix, Stephen R.; and Adams, Milton R., 4,428,194, Cl. 60-39.020.

Adamson, Fletcher D., to Russell Corporation. Process and apparatus for stopping draw frames and the like. 4,428,097, Cl. 19-0.250.

Adamson, James C. Solar skylight. 4,428,358, Cl. 126-417.000.

Adell, Robert, to U.S. Product Development Company. Edge guard. 4,429,013, Cl. 428-122.000.

Adinamis, Peter J. Illuminated ornamental structure of interposed transmissive slats and collars. 4,428,988, Cl. 428-8.000.

Adolphi, Heinrich: *See*—
Seufert, Walter; Kiehs, Karl; Husslein, Gerd; Varwig, Juergen; Hamprecht, Gerhard; and Adolphi, Heinrich, 4,428,944, Cl. 424-217.000.

Adrian, Adolf: *See*—
de Baan, Johannes J.; and Adrian, Adolf, 4,428,566, Cl. 267-64.150.

Adrian, James M.; and Mitnick, Victor H., to Bell Telephone Laboratories, Incorporated. Voltage detector circuit. 4,429,185, Cl. 179-18.0FA.

Agfa-Gevaert Aktiengesellschaft: *See*—
Boie, Immo; Peters, Manfred; and Kaluschke, Thomas, 4,429,033, Cl. 430-237.000.
Moll, Franz; and Holl, Ingeborg, 4,429,038, Cl. 430-510.000.

Agfa-Gevaert N.V.: *See*—
Matthe, Herman L.; Van Gossum, Lucien J.; and Mertens, Ludovicus M., 4,429,032, Cl. 430-231.000.

Agnes, Giovanni; Rucci, Guglielmo; and Santini, Claudio, to Montedison S.p.A. Process for the preparation of diesters of saturated carboxylic acids. 4,429,147, Cl. 560-81.000.

Aihara, Kiyoshi: *See*—
Fukada, Shunsuke; Aihara, Kiyoshi; and Ibaragi, Hideo, 4,429,002, Cl. 428-287.000.

Aikawa, Tetsuo: *See*—
Kato, Shunichi; and Aikawa, Tetsuo, 4,428,225, Cl. 73-65.000.

Akada, Mitsuo: *See*—
Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, 4,429,164, Cl. 568-377.000.

Akasaka, Yoshimichi: *See*—
Ichiryu, Ken; Watanabe, Haruo; Nakamura, Ichiro; and Akasaka, Yoshimichi, 4,428,559, Cl. 251-129.000.

Akita, Shigeyuki: *See*—
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,428,232, Cl. 73-304.00C.

Akiyama, Susumu: *See*—
Suzuki, Atsushi; Omori, Norio; Ninomiya, Masakazu; Akiyama, Susumu; and Hirabayashi, Yuji, 4,428,342, Cl. 123-419.000.

Akzona Incorporated: *See*—
Frank, Dieter; and Metcalfe, Lincoln D., 4,429,023, Cl. 428-694.000.

Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., to Merck & Co., Inc. Strain of Streptomyces for producing antiparasitic compounds. 4,429,042, Cl. 435-119.000.

Albert-Frankenthal AG: *See*—
Dorow, Joachim, 4,428,291, Cl. 101-350.000.

Albright, Eugene A. Magnetostatic electrical devices. 4,429,314, Cl. 343-788.000.

Alcolac Inc.: *See*—
Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billioux, Yves J., 4,429,095, Cl. 526-263.000.

Alig, Roger C.: *See*—
Vieland, Leon J.; and Alig, Roger C., 4,429,252, Cl. 313-414.000.

Allard, Martin E.; and Wilcox, Joseph A., to Brent Chemicals International Limited. Variable threshold workpiece examination. 4,428,672, Cl. 356-237.000.

Allen, James R.; Anderson, LaVerne, Jr.; and Leemans, Daniel L., to Deere & Company. Grain handling arrangement for an articulated combine. 4,428,182, Cl. 56-14.600.

Allen, Linus S., to Mobil Oil Corporation. Method for determining fluid saturation characteristics of subsurface formations. 4,429,221, Cl. 250-256.000.

Allen, Richard A. Collapsable bicycle carrier. 4,428,516, Cl. 224-314.000.

Allen, Thomas E. Telephone call screener. 4,429,188, Cl. 179-84.00C.

Allied Corporation: *See*—
Zudkevitch, David; Belsky, Stephen E.; and Krautheim, Preston D., 4,428,798, Cl. 203-18.000.

Allis-Chalmers Corporation: *See*—
Geiersbach, Allois F.; and Gilmore, Thomas P., 4,428,150, Cl. 47-1.300.

Alloway, Joseph R., to Alloway, Joseph R.; and Vizzoni, Dominick A. Safety ashtray. 4,428,386, Cl. 131-231.000.

Aluminum Company of America: *See*—
Tarcy, Gary P., 4,428,800, Cl. 204-1.00T.

American Can Company: *See*—
Sheptak, Nicholas, 4,429,015, Cl. 428-201.000.

American Cast Iron Pipe Company: *See*—
Conner, Randall C., 4,428,604, Cl. 285-321.000.

American Cyanamid Company: *See*—
Casey, Donald J.; and Roby, Mark S., 4,429,080, Cl. 525-415.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Lai Chen, Sow-Mei, 4,429,148, Cl. 560-118.000.
Lin, Wenlii; and Imbaratto, John W., 4,429,046, Cl. 435-253.000.
Murdock, Keith C., 4,428,882, Cl. 260-379.000.
Schaefer, Frederic C., 4,429,096, Cl. 526-287.000.

American Hospital Supply Corporation: *See*—
DeVroom, William A., 4,428,383, Cl. 128-748.000.

American Manufacturing Company, Inc.: *See*—
Whittaker, Vernon; and Kayros, Richard, 4,428,444, Cl. 177-187.000.

American Newspaper Publishers Association: *See*—
Cichelli, Richard J.; and Thompson, Michael O., 4,429,385, Cl. 370-92.000.

American Steamship Company: *See*—
Bassett, Noel L.; and King, Henry R., 4,428,504, Cl. 222-55.000.

Amor, Kenneth: *See*—
Walker, David J.; and Amor, Kenneth, 4,428,782, Cl. 148-129.000.

AMP Incorporated: *See*—
Crumley, J. A.; and Weaver, John P., 4,429,301, Cl. 340-365.00S.
Feldman, Steven, 4,429,247, Cl. 310-322.000.
Hamsher, Wilbur A., Jr.; and Weber, Robert N., 4,428,635, Cl. 339-74.00R.

Kam, Lit-Yam; and Olsson, Billy E., 4,428,636, Cl. 339-97.00P.
Lundergan, Robert G.; and Marks, Richard L., 4,428,633, Cl. 339-17.0CF.
Teagno, Vladimiro, 4,428,114, Cl. 29-857.000.
AMSTED Industries Incorporated: *See*—
Holstrom, John R., 4,428,242, Cl. 73-861.750.
Anderson, Burton C.; England, David C.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Cyclic monomers derived from trifluoropyruvate esters. 4,429,143, Cl. 549-450.000.
Anderson, David F. High efficiency photoionization detector. 4,429,228, Cl. 250-374.000.
Anderson, Kenneth M.; and Brumwell, Dennis A., to Medtronic, Inc. Rate adaptive pacer. 4,428,378, Cl. 128-419.0PG.
Anderson, LaVerne, Jr.: *See*—
Allen, James R.; Anderson, LaVerne, Jr.; and Leemans, Daniel L., 4,428,182, Cl. 56-14.600.
Anderson, Patrick J.; and Kenny, Andrew A., to Eaton Corporation. Quick vent response valve. 4,428,393, Cl. 137-117.000.
Anderson, Thomas E., to General Electric Company. Inverter circuit with symmetry control. 4,429,359, Cl. 363-132.000.
Andre, Robert; and LeMert, Alfred J., to Ludwig Industries, Inc. Drum hoop. 4,428,272, Cl. 84-413.000.
Andrejco, Matthew J.; and Potkay, Eugene, to Western Electric Company, Inc. Vapor-phase axial deposition system. 4,428,762, Cl. 65-3.120.
Andretta, Angelo: *See*—
Fischer, Bruno; and Andretta, Angelo, 4,428,113, Cl. 29-736.000.
Anic, S.p.A.: *See*—
Pedretti, Ugo; Lugli, Gabriele; Poggio, Sergio; and Mazzei, Alessandro, 4,429,089, Cl. 526-153.000.
Anstey, Henry D., to Deere & Company. Cylindrical baler with self-cleaning drive roller. 4,428,282, Cl. 100-88.000.
Antonasson, Sylve: *See*—
Hedren, Thomas; Eriksson, Albert; Antonasson, Sylve; and Larsson, Rolf, 4,428,186, Cl. 59-16.000.
Antos, George J.: *See*—
Hobbs, Simon H.; Rogers, Edward S.; and Antos, George J., 4,428,827, Cl. 208-120.000.
Aomi, Hideki: *See*—
Enjo, Naonori; and Aomi, Hideki, 4,428,854, Cl. 252-69.000.
Apperson, Kenneth P., to Square D Company. Flip top automatic deadend. 4,428,100, Cl. 24-115.00R.
Aratani, Tadatoshi: *See*—
Nishizawa, Kanji; Hanada, Kazuhiko; and Aratani, Tadatoshi, 4,429,163, Cl. 568-432.000.
Arbed S.A.: *See*—
Limpach, Raymond; and Boecker, Dietrich, 4,428,769, Cl. 75-30.000.
Arcari, Giuliana: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,428,952, Cl. 424-251.000.
Archer, John D., to Archer, John David. Utilization of wind energy. 4,428,711, Cl. 415-2.00A.
Archer, John David: *See*—
Archer, John D., 4,428,711, Cl. 415-2.00A.
Archer, Sydney; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, to World Health Organization. Esters of 17 α-ethynyl 19-nor-testosterone and 17 α-ethynyl-18 homo-19-nor-testosterone and pharmaceutical compositions containing the same. 4,428,947, Cl. 424-243.000.
Arctic Pilot Project Inc.: *See*—
Gruzling, Joe; Johansson, Bengt; Keinonen, Arno; Revill, Colin; and Laskow, Vlodek, 4,428,735, Cl. 440-76.000.
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Goetz, Norbert; Jacobs, Peter; Hupfer, Leopold; Toussaint, Herbert; and Reiss, Wolfgang, 4,429,155, Cl. 564-402.000.
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Beacon, Robert G., to Ellcon-National, Inc. Railway vehicle brake system with four-way valve. 4,428,622, Cl. 303-84.00R.

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Becker, Herbert; Sunkel, Manfred; Grams, Volker; and Scheihorn, Gerhard, to Metallwerk Max Brose GmbH & Co. Electric drive, particularly for a window lifting mechanism in a motor vehicle. 4,428,250, Cl. 74-425.000.

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Ponsford, Roger J., 4,428,958, Cl. 424-272.000.
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Howard, Richard E.; Pleibel, William; and Stolen, Roger H., 4,428,761, Cl. 65-3.120.
Lee, Robert C., 4,429,391, Cl. 371-49.000.
Lipari, Dominic T., 4,428,092, Cl. 15-246.000.
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Stockbridge, Christopher D. G., 4,429,190, Cl. 179-111.00E.
Swartz, Robert G., 4,428,111, Cl. 29-576.00E.

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Benin, Joshua; Mulholland, Kenneth L.; and Reichenberg, John F., to Du Pont de Nemours, E. I., and Company. Apparatus to assist doffing of a yarn windup. 4,428,539, Cl. 242-18.00A.

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Bennett, Willard H. Production and utilization of ion cluster acceleration by means of potential well. 4,428,901, Cl. 376-105.000.

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Bertolazzi, Luciano F., to Chicago Bridge & Iron Company. Method for inside coating double curved shell. 4,428,985, Cl. 427-230.000.

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Best, Walter E.; and Foshee, William R., 4,428,212, Cl. 70-224.000.
Foshee, William R.; and Carey, Kevin L., 4,428,570, Cl. 267-164.000.

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Birchfield, Jerry L.; and Sheppard, Albert P., Jr., to Georgia Tech Research Institute. Linear down-draft biomass gasifier. 4,428,308, Cl. 110-229.000.

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Blakely, Stephen W. Heat absorbing element and method of manufacture. 4,428,420, Cl. 165-183.000.

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Blau, Jonathan S.; and Rosen, Josh, to Data General Corporation. Arithmetic unit for use in a data processing system for computing exponent results and detecting overflow and underflow conditions thereof. 4,429,370, Cl. 364-748.000.

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Beasley, Marvin D.; Blystone, Wayne G.; and Lemmon, Gerald W., 4,428,418, Cl. 165-76.000.

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Jabs, Gert; Baatz, Gunther; Bock, Manfred; Dahm, Manfred; Haus, Artur; and Wegner, Christian, 4,428,978, Cl. 427-150.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Prins reaction products of diisoamylene, derivatives thereof, organoleptic uses thereof and processes for preparing same. 4,429,151, Cl. 560-261.000.

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Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,428,387, Cl. 131-276.000.

Boecker, Dietrich: *See*—
Limpach, Raymond; and Boecker, Dietrich, 4,428,769, Cl. 75-30.000.

Boehringer Mannheim GmbH: *See*—
Becker, Udo; and Roeschlau, Peter, 4,429,040, Cl. 435-7.000.
Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Egon; and Wilhelms, Otto-Henning, 4,428,955, Cl. 424-267.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Aircraft split hydraulic system. 4,428,196, Cl. 60-403.000.

Boeing Company, The: *See*—
Bachr, Theodore C., 4,428,609, Cl. 292-251.000.
King, Charles H., 4,429,341, Cl. 361-117.000.

Boguslawski, George; and Boyer, Ernest W., to Miles Laboratories, Inc. Preparation of an alkaline protease from flavobacterium arborescens. 4,429,044, Cl. 435-220.000.

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Boise Cascade Corporation: *See*—
Westphal, Teddy M., 4,428,741, Cl. 493-103.000.

Bolton, James C., to Industrial Tools Inc. Tape slitter axial loading system. 4,428,265, Cl. 83-502.000.

Boray, Joseph C.; Gallay, Jean J.; and Sarasin, Gedeon, to Ciba-Geigy Corporation. 6-Isothiocyano-5-methoxy-2-tert.-butylbenzthiazole and a method of controlling ruminant liver flukes therewith. 4,428,957, Cl. 424-270.000.

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Billias, Michael G.; and Borders, Michael E., 4,428,867, Cl. 252-512.000.

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Sproul, William D.; and Tomashek, James R., 4,428,811, Cl. 204-192.00R.
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Bose, Phillip R., to Chevron Research Company. Upgrading hydrocarbonaceous oils with an aqueous liquid. 4,428,828, Cl. 208-208.00R.

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Botwin, Leo; and Simpson, John A., to United Technologies Corporation. Gun-launched variable thrust ramjet projectile. 4,428,293, Cl. 102-381.000.

Bourbeau, Claude. Tree-processing apparatus. 4,428,407, Cl. 144-2.00Z.

Bourke, Eleanor F.: *See*—
Edelson, Richard L., 4,428,744, Cl. 604-6.000.

Bourke, Frederic A., Jr.: *See*—
Edelson, Richard L., 4,428,744, Cl. 604-6.000.

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Stouffer, Ronald D., 4,428,277, Cl. 98-2.000.

Boxall, Larry G.; and Nagle, Dennis C., to Martin Marietta Corporation. Anode stud coatings for electrolytic cells. 4,428,847, Cl. 502-101.000.

Boyarina, Maya F.; Vildgrube, Vladimir G.; and Sergeev, Jury S. Non-evaporable getter. 4,428,856, Cl. 252-181.100.

Boyd, Alvin L.: *See*—
Wicheta, William E.; and Boyd, Alvin L., 4,428,929, Cl. 424-49.000.

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Brahm, Jacques: *See*—
Verlaeten, Jean; and Brahm, Jacques, 4,428,918, Cl. 423-473.000.

Brammer, Hartmut, to Robert Bosch GmbH. Transducer for ignition timing. 4,428,332, Cl. 123-146.50A.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,428,472, Cl. 192-98.000.

Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,428,949, Cl. 424-245.000.

Branecky, George: *See*—
Denison, Philibert E., III; and Branecky, George, 4,428,573, Cl. 271-305.000.

Brauner, Arne H., to International Paper Company. Easy access sandwich carton. 4,428,525, Cl. 229-41.00R.

Bravo, Sergio M. Lock apparatus for storage tanks. 4,428,395, Cl. 137-385.000.

Brax, Jean A., to Saint-Gobain Emballage. Thermocouple pyrometric apparatus. 4,428,686, Cl. 374-179.000.

Bredesky, Louis P., Jr.: *See*—
Head, Glenn D., Jr.; Le Master, William C.; Bredesky, Louis P., Jr.; and Winter, David C., 4,428,214, Cl. 72-69.000.

Breedis, John F.; and Fister, Julius C., to Olin Corporation. Composite material having improved bond strength. 4,429,022, Cl. 428-675.000.

Breezer, Harlan W.: *See*—
Dresen, William L.; Price, William F.; and Breezer, Harlan W., 4,428,306, Cl. 108-53.300.

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Deussner, Herbert; Herchenbach, Horst; Ramesohl, Hubert; and Breidenstein, Wolfgang, 4,428,727, Cl. 431-182.000.

Breitenfellner, Franz, to Ciba-Geigy Corporation. Light-reflecting body. 4,429,004, Cl. 428-324.000.

Bremer, Noel J.: *See*—
Blum, Patricia R.; Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,429,137, Cl. 549-259.000.

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Brenner, Klaus: *See*—
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Brent Chemicals International Limited: *See*—
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Brichard, Jean; and Colery, Jean-Claude, to Interox. Process for making sodium percarbonate granules. 4,428,914, Cl. 423-265.000.

Bridger, Robert F., to Mobil Oil Corporation. Molybdenum IV compounds, process for preparation thereof and lubricant compositions containing same. 4,428,861, Cl. 252-32.70E.

Brigham, Alan, to Raychem Corporation. Conductive element. 4,429,216, Cl. 219-528.000.

Brindley, Robert J.; Taravella, Salvatore R.; and Dean, Robert M., to National Gypsum Company. Electrical heating panel. 4,429,214, Cl. 219-345.000.

Brister, Beryle D. Method for forming a temporary plug in a fluid conduit. 4,428,204, Cl. 62-62.000.

Bristol, James A.; and Puchalski, Chester, to Schering Corporation. Indoles in treatment of peptic ulcers. 4,428,962, Cl. 424-274.000.

Bristol-Myers Company: *See*—
Belleau, Bernard R.; and Franchini, Carlo, 4,428,889, Cl. 260-927.00R.

British Aerospace Public Limited Company: *See*—
Halliday, David P.; Riley, John F.; and Sharrock, Barry, 4,428,549, Cl. 244-1.00R.

British Nuclear Fuels Limited: *See*—
Evans, Frank, 4,428,836, Cl. 210-189.000.

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Davies, Evan E.; and Nebrensky, Jiri R., 4,428,839, Cl. 210-512.300.

British Petroleum Company p.l.c., The: *See*—
Reece, Alan R., 4,428,132, Cl. 37-193.000.

British Rema Manufacturing Co., Limited: *See*—
Rodgers, Jeffrey C., 4,428,536, Cl. 241-52.000.

Brodbeck, Klaus P.: *See*—
Mittelmann, Gerhard; and Brodbeck, Klaus P., 4,428,491, Cl. 220-1.500.

Bron, Dan. Fluid flow control device. 4,428,397, Cl. 137-504.000.

Bronicki, Lucien Y., to Ormat Turbines, Ltd. Power plant utilizing multi-stage turbines. 4,428,190, Cl. 60-655.000.

Broschinski, Lothar: *See*—
Disteldorf, Josef; Hubel, Werner; and Broschinski, Lothar, 4,429,157, Cl. 564-446.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Takiguchi, Michitaka; Naganuma, Nobuyuki; and Horie, Fujio, 4,428,313, Cl. 112-220.000.

Broucksou, Robert H.; Martin, George; and Oster, Richard J., to Eaton Corporation. Shifting actuator. 4,428,248, Cl. 74-335.000.

Brown, Johnny F., to Varian Associates, Inc. Feed forward AC voltage regulator employing step-up, step-down transformer and analog and digital control circuitry. 4,429,269, Cl. 323-301.000.

Brown, Marvin R.: *See*—
Rivier, Jean E. F.; Vale, Wylie W., Jr.; and Brown, Marvin R., 4,428,942, Cl. 424-177.000.

Brown, Morton E., to Southern Gas Association. Relative horsepower indicator. 4,429,371, Cl. 364-803.000.

Brown, Paul F., to United Technologies Corporation. High speed, durable roller bearing. 4,428,628, Cl. 308-187.000.

Brown, Paul L. Toy balloon closure device. 4,428,149, Cl. 46-90.000.

Brown, Ralph V.: *See*—
Abbott, Johnnie G.; and Brown, Ralph V., 4,428,105, Cl. 29-149.50B.

Brownell, David B. Quick release device. 4,428,102, Cl. 24-574.000.

Brownlee, David C.: *See*—
Kolpin, Barbara E.; and Brownlee, David C., 4,429,001, Cl. 428-283.000.

Bruce, Peter. Joining shackle or link. 4,428,187, Cl. 59-85.000.

Bruder, Alan H., to Polaroid Corporation. Laminar multicell lithium batteries. 4,429,026, Cl. 429-152.000.

Brumwell, Dennis A.: *See*—
Anderson, Kenneth M.; and Brumwell, Dennis A., 4,428,378, Cl. 128-419.0PG.

Brunswick Corporation: *See*—
Councilman, Richard R., 4,428,544, Cl. 242-84.21R.

Buchanan, Margaret A.: *See*—
Webb, James B.; Williams, Digby F.; and Buchanan, Margaret A., 4,428,810, Cl. 204-192.00P.

Buchel, Karl H.: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,428,949, Cl. 424-245.000.

Buck, Yves; and Delcoigne, Adrien, to Isover Saint-Gobain. U-Shaped plasterboard. 4,428,898, Cl. 264-167.000.

Budd Company, The: *See*—
Herring, James M., Jr., 4,428,302, Cl. 105-197.00R.
Jahnle, Herbert A., 4,428,599, Cl. 280-784.000.

Buhler, Fritz: *See*—
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Schrewelius, Nils G., deceased, 4,429,019, Cl. 428-550.000.

Bungay, Michael R., to Lucas Industries Limited. Apparatus for indicating dielectric constant. 4,429,272, Cl. 324-61.00R.

Burg, Richard W.: *See*—
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,429,042, Cl. 435-119.000.

Burgdorf, Jochen; Luepertz, Hans-Henning; and Stoka, Roberto, to ITT Industries Inc. Retaining spring for the brake shoe of a spot type disc brake. 4,428,463, Cl. 188-73.380.

Burghart, George L. Roof curb and linear curb form having inner and outer supporting walls. 4,428,166, Cl. 52-19.000.

Burke, Anthony E., to Xerox Corporation. Combined sheet inverter and sorter. 4,428,572, Cl. 271-297.000.

Burrell, William E., to W. R. Grace & Co., Cryovac Div. Reel clip feed system. 4,428,176, Cl. 53-138.00A.

Burroughs Corporation: *See*—
Catiller, Robert D., 4,429,389, Cl. 371-21.000.
Zachry, Clyde L., 4,429,349, Cl. 361-414.000.

Burt, Harold S., to Midwest Conveyor Co., Inc. Apparatus and method for fine positioning a vehicle at a storage bin in an automatic storage and retrieval system. 4,428,708, Cl. 414-275.000.

Burtoft, Joseph H. Energy free loader. 4,428,178, Cl. 53-475.000.

Burzin, Klaus; Bartmann, Martin; Bax, Hanns-Jorg; and Ribbing, Wilfried, to Chemische Werke Huels AG. Method of producing polyphenylene oxides using morpholinium bromide as activator. 4,429,106, Cl. 528-216.000.

Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., to Bell Telephone Laboratories, Incorporated. Electret transducer with variably charged electret foil. 4,429,191, Cl. 179-111.00E.

Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., to Bell Telephone Laboratories, Incorporated. Electret transducer with variable electret foil thickness. 4,429,192, Cl. 179-111.00E.

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Busch-Vishniac, Ilene J.: *See*—
Berkley, David A.; Busch-Vishniac, Ilene J.; Wallace, Robert L., Jr.; and West, James E., 4,429,189, Cl. 179-111.00E.

Bushnell, Dennis M.: *See*—
Morrisette, E. Leon; and Bushnell, Dennis M., 4,428,703, Cl. 406-155.000.

Butcher, James S., to GTE Automatic Electric Labs Inc. Audio distributing system. 4,429,187, Cl. 179-81.00R.

Butler, L. Dennis; and Askov, Alan R., to Sperry Corporation. Interlock selector control valve for round bale wagon. 4,428,706, Cl. 414-24.500.

Butler Manufacturing Company: *See*—
Flachbarth, Charles T.; and Benscoter, Richard D., 4,428,641, Cl. 339-205.000.

Buttner, Robert C., to Concrete Pipe & Products Corp. Step driver. 4,428,522, Cl. 227-8.000.

Bux, Werner; and Mueller, Hans R., to International Business Machines Corp. Method of transmitting information between stations attached to a unidirectional transmission ring. 4,429,405, Cl. 375-89.000.

Byar, Robert R.: *See*—
Morscheck, Timothy J.; Byar, Robert R.; and Deska, Theodore J., 4,428,469, Cl. 192-53.00E.

Cain, Charles J.: *See*—
Shankle, Arthur T., 4,429,308, Cl. 340-870.370.

Cairns, James A.; Lane, Edward S.; Prentice, Thomas C.; Segal, David L.; and Sammon, David C., to United Kingdom Atomic Energy Authority. Coating of substrates. 4,428,864, Cl. 502-151.000.

Calcagno, Kenneth H.; and Calcagno, William F., Jr. Apparatus for maintaining the relative position between wire being fed onto a bobbin and wire wound about the bobbin for forming a coil of wire. 4,428,540, Cl. 242-25.00R.

Calcagno, William F., Jr.: *See*—
Calcagno, Kenneth H.; and Calcagno, William F., Jr., 4,428,540, Cl. 242-25.00R.

Calcutt, Wilfred, to Swift Instruments, Inc. Click-stop focusing of binoculars. 4,428,651, Cl. 350-556.000.

Calderone, Theodore: *See*—
Wong, Shi-Yin; Little, Michael J.; Margeram, J. David; Nussmeier, Thomas A.; Calderone, Theodore; and Dellamano, Harry A., 4,428,380, Cl. 128-715.000.

Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., to Dow Chemical Co., The. Electrodes for oxygen manufacture. 4,428,805, Cl. 204-129.000.

Calentine, John W.: *See*—
Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billioux, Yves J., 4,429,095, Cl. 526-263.000.

Callahan, Lynn T., III: *See*—
Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, 4,428,931, Cl. 424-87.000.

Callicott, Robert H., to Procter & Gamble Company, The. Composition to inhibit staining of porcelain surfaces by manganese. 4,428,872, Cl. 252-550.000.

Calundann, Gordon W.: *See*—
Charbonneau, Larry F.; and Calundann, Gordon W., 4,429,100, Cl. 528-128.000.

Campbell, Bonnie J.; Counts, Thomas G.; Cunningham, James L.; and Youtsey, Karl J., to UOP Inc. Method of making double wall tubing assembly. 4,428,106, Cl. 29-157.30A.

Campbell, Bruce D.; and Triplett, James T., to Raychem Corporation. Cable preconnectorization method. 4,428,115, Cl. 29-873.000.

Canadian Patents and Development Limited: *See*—
Webb, James B.; Williams, Digby F.; and Buchanan, Margaret A., 4,428,810, Cl. 204-192.00P.

Cannon, Jack W., to International Business Machines Corporation. High speed impact matrix printer. 4,428,692, Cl. 400-124.000.

Canon Kabushiki Kaisha: *See*—
Hattori, Yoshihumi; Terasawa, Koji; and Kasugayama, Yukio, 4,429,320, Cl. 346-140.00R.
Kobata, Yoshihiro, 4,429,318, Cl. 346-76.0PH.
Matsumoto, Shigeyuki, 4,429,321, Cl. 346-140.00R.
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,428,652, Cl. 354-407.000.
Sato, Tadashi; and Tanaka, Keiji, 4,428,664, Cl. 355-14.00R.
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Tokuhara, Mitsuhiro; Yamada, Yu; Takemura, Yukio; Kuwayama, Takeshi; and Seto, Susumu, 4,429,353, Cl. 362-232.000.

Capaul, Barry D.: *See*—
Capaul, Raymond W.; and Capaul, Barry D., 4,428,454, Cl. 181-290.000.

Capaul, Raymond W.; and Capaul, Barry D. Acoustical panel construction. 4,428,454, Cl. 181-290.000.

Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, to Pierrel S.p.A. 3-O-Oleandrosyl-5-O-desosaminyl erythronolide compounds. 4,429,115, Cl. 536-7.200.

Capro, Inc.: *See*—
Carlson, John A., 4,428,180, Cl. 56-11.300.

Capshew, Charles E., to Phillips Petroleum Company. Polymerization catalyst and process. 4,429,087, Cl. 526-119.000.

Capterpillar Tractor Co.: *See*—
Reinsma, Harold L., 4,428,589, Cl. 277-101.000.

Carey, Kevin L.: *See*—
Foshee, William R.; and Carey, Kevin L., 4,428,570, Cl. 267-164.000.

Carl Freudenberg, Firma: *See*—
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Carl Kurt Walther GmbH & Co. KG: *See*—
Walther, Carl K.; Hageluken, Hubert P.; and Temme, Karl, 4,428,161, Cl. 51-163.200.

Carley, Harold J., to Corning Glass Works. Devices for use in a glass-melting furnace. 4,429,402, Cl. 373-37.000.

Carlson, John A., to Capro, Inc. Lawn mower and controls therefor. 4,428,180, Cl. 56-11.300.

Carlson, John E., to Chem-Nuclear Systems, Inc. Cross-linked urea-formaldehyde polymer matrix compositions containing cyclic intermediate structures. 4,429,075, Cl. 524-35.000.

Carlson, Timothy L.: *See*—
Ward, John W.; and Carlson, Timothy L., 4,428,825, Cl. 208-109.000.
Ward, John W.; and Carlson, Timothy L., 4,428,862, Cl. 502-77.000.

Carson, Don B., to UOP Inc. Power generation with fractionator overhead vapor stream. 4,428,201, Cl. 60-648.000.

Carson, Don B., to UOP Inc. Electrical power generation by fractionation column reboiler. 4,428,202, Cl. 60-648.000.

Carson, Don B., to UOP Inc. Power generation using fractionation column reboiler systems. 4,428,203, Cl. 60-648.000.

Carstens, Jeffrey P.; Blaszuk, Paul R.; and Foley, John S., to United Technologies Corporation. Laser pipe welding system for nonstationary pipe. 4,429,211, Cl. 219-121.0LC.

Carter, Frederick J. Stock grid. 4,428,562, Cl. 256-17.000.

Casey, Donald J.; and Roby, Mark S., to American Cyanamid Company. Synthetic copolymer surgical articles and method of manufacturing the same. 4,429,080, Cl. 525-415.000.

Casey, Paul G.; and Dawson, Robert F., to Hinesburg Sand and Gravel Company. Sand classification plant with process control system. 4,428,505, Cl. 222-64.000.

Casio Computer Co. Ltd.: *See*—
Kashio, Toshio, 4,428,681, Cl. 368-21.000.

Cassai, Gino H.; and Cassai, Henry J. Adjustable cosmetic wand. 4,428,388, Cl. 132-88.700.

Cassai, Henry J.: *See*—
Cassai, Gino H.; and Cassai, Henry J., 4,428,388, Cl. 132-88.700.

Cataldo, Roy S., to General Motors Corporation. Engine intake port with annular nozzle directed swirl. 4,428,335, Cl. 123-188.00M.

Caterpillar Tractor Co.: *See*—
Fischer, Robert L., 4,428,255, Cl. 74-813.00L.
Knell, Harvey A., 4,428,173, Cl. 52-731.000.
Wiggins, Jesse O., 4,428,715, Cl. 415-199.200.

Cathey, LeConte: *See*—
Jones, Edwin R., Jr.; Cathey, LeConte; and McLaurin, A. Porter, 4,429,328, Cl. 358-88.000.

Catiller, Robert D., to Burroughs Corporation. Test pattern address generator. 4,429,389, Cl. 371-21.000.

Catterfeld, Fritz C., to Rockwell International Corporation. Composite centrifugal impeller for slurry pumps. 4,428,717, Cl. 416-186.00R.

Cavalla, John F.; and Wyllie, Michael G., to John Wyeth and Brother Limited. Method for treatment of cerebrovascular disorders. 4,428,954, Cl. 424-263.000.

Cavani, Tiziano. Hollow charge endothermic motor. 4,428,350, Cl. 123-536.000.

Cedrone, Nicholas J. Handling and test apparatus for radial lead electronic devices. 4,429,275, Cl. 324-158.00F.

Celanese Corporation: *See*—
Charbonneau, Larry F.; and Calundann, Gordon W., 4,429,100, Cl. 528-128.000.
Charbonneau, Larry F., 4,429,105, Cl. 528-207.000.
Ide, Yoshiaki, 4,429,060, Cl. 521-182.000.
Ide, Yoshiaki, 4,429,061, Cl. 521-182.000.

Cerberus AG: *See*—
Wagli, Peter, 4,429,223, Cl. 250-342.000.
Wagli, Peter; Zetting, Alois; and Pfister, Gustav, 4,429,224, Cl. 250-342.000.

Ceresa, Luciano: *See*—
Bovio, Michele; Sella, Lino; Berruti, Pierangelo; Gillone, Walter; and Ceresa, Luciano, 4,428,693, Cl. 400-126.000.

Chabria, Paul R. Method and gun for in situ formation of foam in packages. 4,428,530, Cl. 239-8.000.

Chafetz, Harry: *See*—
Levine, Stephen A.; Schlicht, Raymond C.; Chafetz, Harry; and Whiteman, James R., 4,428,848, Cl. 252-32.7HC.

Chaki, Takao; Watanabe, Nobuaki; and Kanai, Takao, to Clarion Co., Ltd. Indicator mechanism in a pushbutton tuner. 4,428,322, Cl. 116-261.000.

Chambers, Vaughan C., Jr.; and Gervay, Joseph E., to Du Pont de Nemours, E. I., and Company. Photoimaging process. 4,429,027, Cl. 430-5.000.

Champion Spark Plug Europe S.A.: *See*—
Denis, Phillippe, 4,428,093, Cl. 15-250.420.

Chang, Ching-Jen; and Stevens, Travis E., to Rohm and Haas Company. Alkyl poly(oxyalkylene) esters of acrylate oligomers and copolymers thereof for thickening purposes. 4,429,097, Cl. 526-317.000.

Chang, Kern K. N., to RCA Corporation. Deflection yoke integrated within a cathode ray tube. 4,429,254, Cl. 315-3.000.

Chang, Robert W. H., to Minnesota Mining and Manufacturing Company. Compositions and method for reducing elution of therapeutic agents from teeth. 4,428,930, Cl. 424-52.000.

Chang, Shien-Fanh. Pulverized-coal and liquid-fuel dual-purpose burner. 4,428,309, Cl. 110-262.000.

Chang, Wen-Hsuan: *See*—
Lee, Kyu-Wang; Peffer, John R.; Piccirilli, Robert; and Chang, Wen-Hsuan, 4,429,082, Cl. 525-426.000.

Chapman, Richard A., to Texas Instruments Incorporated. Infrared matrix using transfer gates. 4,429,330, Cl. 358-113.000.

Charbonneau, Larry F.; and Calundann, Gordon W., to Celanese Corporation. Polyester of 6-hydroxy-2-naphthoic acid, para-hydroxybenzoic acid, 2,6-dioxyanthraquinone, and aromatic diacid. 4,429,100, Cl. 528-128.000.

Charbonneau, Larry F., to Celanese Corporation. Process for preparing a polyester of hydroxy naphthoic acid and hydroxy benzoic acid. 4,429,105, Cl. 528-207.000.

Charnay, Patrick: *See*—
Galibert, Francis; Tiollais, Pierre; and Charnay, Patrick, 4,428,941, Cl. 424-177.000.

Chastang, Jean C. A.; and Koerner, Robert F., to International Business Machines Corporation. Optical system for oblique viewing. 4,428,676, Cl. 356-354.000.

Chatterjea, Probir K., to Dresser Industries, Inc. Clutch-clutch brake steering mechanism for tractors. 4,428,468, Cl. 192-13.00R.
Chatziiosifidis, Ioannis: *See*—
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Chem-Nuclear Systems, Inc.: *See*—
Carlson, John E., 4,429,075, Cl. 524-35.000.
Chemap AG: *See*—
Muller, Hans; Gayler, Rudolf; and Rapsomanikis, Nikolas, 4,428,969, Cl. 426-53.000.
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Burzin, Klaus; Bartmann, Martin; Bax, Hanns-Jorg; and Ribbing, Wilfried, 4,429,106, Cl. 528-216.000.
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Chen, Tsu-Fang, to Sperry Corporation. Electroplating apparatus with constant velocity agitation. 4,428,814, Cl. 204-273.000.
Chenausky, Peter P.; Mongeon, Robert J.; Drinkwater, Erroll H.; and Laughman, Lanny M., to United Technologies Corporation. Twin waveguide laser. 4,429,398, Cl. 372-64.000.
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Chesner, Ramon J. Heat exchanger cleaner. 4,428,417, Cl. 165-5.000.
Chester, Arthur W.; and Chu, Yung F., to Mobil Oil Corporation. Active zeolite catalysts of improved stability. 4,429,176, Cl. 585-481.000.
Chevron Research Company: *See*—
Abbott, Barry J.; and Silcox, William H., 4,428,702, Cl. 405-202.000.
Bezman, Susan A., 4,428,753, Cl. 44-56.000.
Bose, Phillip R., 4,428,828, Cl. 208-208.00R.
Kuehler, Christopher W.; and Beret, Samil, 4,428,820, Cl. 208-10.000.
Loh, William, 4,429,119, Cl. 536-181.000.
Chew, Remedios K.: *See*—
Pastor, Ricardo C.; Gorre, Luisa E.; Pastor, Antonio C.; and Chew, Remedios K., 4,429,009, Cl. 428-410.000.
Chicago Bridge & Iron Company: *See*—
Bertolazzi, Luciano F., 4,428,985, Cl. 427-230.000.
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Romero, Richard A., 4,428,586, Cl. 277-25.000.
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Chuang, Po L. Automatic lavatory seat. 4,428,083, Cl. 4-240.000.
Chuang, Shih, to Statek Corporation. Mounting apparatus and method for piezoelectric tuning fork. 4,429,248, Cl. 310-370.000.
Chun, Duk S.: *See*—
Stermole, David A.; Loehr, Clifford E.; and Chun, Duk S., 4,428,919, Cl. 423-474.000.
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Chynoweth, William R., to Honeywell Inc. Woven wire fanout. 4,429,179, Cl. 174-117.00M.
Ciba-Geigy AG: *See*—
Moore, Michael H.; and Turner, George F. A. M., 4,428,658, Cl. 354-310.000.
Ciba-Geigy Corporation: *See*—
Boray, Joseph C.; Gallay, Jean J.; and Sarasin, Gedeon, 4,428,957, Cl. 424-270.000.
Breitenfellner, Franz, 4,429,004, Cl. 428-324.000.
Cooke, Thomas W.; and Falk, Robert A., 4,429,162, Cl. 568-50.000.
Hubele, Adolf; Riebli, Peter; Eckhardt, Wolfgang; and Kunz, Walter, 4,428,964, Cl. 424-309.000.
Karrer, Friedrich; Berner, Godwin; and Rody, Jean, 4,429,077, Cl. 525-143.000.
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Cihonski, John L., to El Paso Products Company. Process for the production of ethylbenzene. 4,429,175, Cl. 585-433.000.
Citizen Watch Co., Ltd.: *See*—
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City Tank Corporation: *See*—
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CJM Associates: *See*—
Jones, Edwin R., Jr.; Cathey, LeConte; and McLaurin, A. Porter, 4,429,328, Cl. 358-88.000.
Claremon, David A.: *See*—
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Clarion Co., Ltd.: *See*—
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Class, Walter H.; Hieronymi, Robert G.; and Hurwitt, Steven D., to Materials Research Corporation. Focusing magnetron sputtering apparatus. 4,428,816, Cl. 204-298.000.
Claudius Peters AG: *See*—
Schalkhauser, Ulrich, 4,428,473, Cl. 198-367.000.
Clemens, Donald D.; Larson, Elmer M., Jr.; Morgan, William T.; Steele, Oliver P., III; and Wright, Fred R., to Electric Power Research Institute, Inc. Remote visual inspection system. 4,429,329, Cl. 358-100.000.
Clerc, Guy; and Shroff, Arvind, to Thomson-CSF. Direct heating cathode for high frequency thermionic tube. 4,429,250, Cl. 313-336.000.
Coal Industry (Patents) Limited: *See*—
Armstrong, Michael P.; O'Brian, Rodney W.; and Gilliver, Stanley, 4,428,832, Cl. 209-350.000.
Eagles, Brian A.; and Kelly, Jonathan S., 4,428,619, Cl. 299-81.000.
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Coe Manufacturing Company, The: *See*—
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Coffey, Gerald P.: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,429,109, Cl. 528-331.000.
Coggin, Michael E.; Everett, Charles K.; and Schwellenbach, Donald D. Pallet scraper. 4,428,090, Cl. 15-93.00C.
Cognard, Jacques; Phan, Trung H.; and Markert, Jurgen, to Ebauches S.A. Composition based on liquid crystal for electro-optical device. 4,428,858, Cl. 252-299.100.
Cogswell, Frederic N.; and Swerdlow, Martin S., to Imperial Chemical Industries PLC. Anisotropic melt-forming polymer composition containing PTFE. 4,429,078, Cl. 525-165.000.
Cohen, Howard S. Roofing system for solar heat collection and method for fabrication thereof. 4,428,360, Cl. 126-432.000.
Cohen, John M.: *See*—
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Colanzi, Franco; and Vignotto, Angelo, to RIV-SKF Officine di Villar Perosa S.p.A. Protection and seal member for rolling bearings. 4,428,629, Cl. 308-187.200.
Cole, Norman F.; and Thorne, William D., to International Business Machines Corp. Oscillatory band and hammer dot matrix printer. 4,428,285, Cl. 101-93.040.
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Brichard, Jean; and Colery, Jean-Claude, 4,428,914, Cl. 423-265.000.
Collins, Wesley A. Self-balancing belt caddy. 4,428,486, Cl. 211-119.000.
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Smith, Donald J., 4,428,104, Cl. 24-279.000.
Waas, Charles W., 4,428,634, Cl. 339-42.000.
Concord Laboratories, Inc.: *See*—
Raitto, Russell G., 4,428,384, Cl. 128-760.000.
Concrete Pipe & Products Corp.: *See*—
Buttner, Robert C., 4,428,522, Cl. 227-8.000.
Concrete Transport Mixer Co.: *See*—
Schreiter, Paul W., Jr., 4,428,677, Cl. 366-41.000.

Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, to Hoffmann-La Roche Inc. Novel thiophene derivatives. 4,428,963, Cl. 424-275.000.

Conner, Randall C., to American Cast Iron Pipe Company. Restrained pipe joint and associated snap-ring. 4,428,604, Cl. 285-321.000.

Consolidated Systems, Inc.: *See*—
Parsons, Albert; and Havens, H. Norris, 4,428,556, Cl. 249-3.000.

Container Corporation of America: *See*—
Kohler, Karl A., 4,428,500, Cl. 220-462.000.
Nauheimer, James F., 4,428,499, Cl. 220-470.000.

Continental-Wirt Electronics Corp.: *See*—
Worth, Sidney V., 4,428,637, Cl. 339-99.00R.

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Cooke, Thomas W.; and Falk, Robert A., to Ciba-Geigy Corporation. Perfluoroalkyl phenols and naphthols. 4,429,162, Cl. 568-50.000.

Cope, Raymond; and King, Michael, to Health Science Products, Inc. Computer key-punch work-station having adjustable copy support-shelf. 4,428,631, Cl. 312-194.000.

Coplin, John F.; and Hadaway, Edward S., to Rolls-Royce Limited. Turbine. 4,428,713, Cl. 415-48.000.

Corning Glass Works: *See*—
Carley, Harold J., 4,429,402, Cl. 373-37.000.
Montierth, Max R., 4,428,758, Cl. 55-523.000.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,429,058, Cl. 521-57.000.

Costantini, John J., to Bendix Corporation, The. Data buffer operating in response to computer halt signal. 4,429,362, Cl. 364-200.000.

Coulson, Fred; and Smith, Jerry M., to Coe Manufacturing Company, The. Jet tube dryer retainer system. 4,428,128, Cl. 34-155.000.

Coulter, Robert S.: *See*—
Deane, Kenneth E.; and Coulter, Robert S., 4,429,195, Cl. 200-38.00A.

Councilman, Richard R., to Brunswick Corporation. Retainer for oscillator system. 4,428,544, Cl. 242-84.21R.

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Cournoyer, Richard L.; and Foley, James W., to Polaroid Corporation. Xanthene compounds. 4,429,142, Cl. 549-394.000.

Covington, Robert A., Jr.; Long, Cecil L.; and Williston, David W., to Du Pont de Nemours, E. I., and Company. Continuous synthesis of chromium dioxide. 4,428,852, Cl. 252-62.560.

Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., to Venture Chemicals, Inc. Well working compositions, method of decreasing the seepage loss from such compositions, and additive therefor. 4,428,843, Cl. 252-8.50C.

Cox, Karmen D., to Roper Corporation. Induction heating apparatus. 4,429,205, Cl. 219-10.770.

Crabbe, Pierre: *See*—
Archer, Sydney; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,428,947, Cl. 424-243.000.

Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc.; and Merck Sharp & Dohme (I.A.) Corp. 4-Hydroxy-5-substituted-3-(2H)-isothiazolone-1,1-dioxide derivatives useful in treating urinary tract calcium oxalate lithiasis. 4,428,956, Cl. 424-270.000.

Cragoe, Edward J., Jr.; and Rooney, Clarence S., to Merck & Co., Inc. 4-Alkylsubstituted-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,428,959, Cl. 424-274.000.

Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., to International Business Machines Corp. High voltage on chip FET driver. 4,429,237, Cl. 307-450.000.

Creps, John L.; Hainen, Timothy J.; and McEwen, Stephen N., to Henry Filters, Inc. Tubular filter structure. 4,428,838, Cl. 210-323.200.

Creske, Edward J. Table top. 4,428,305, Cl. 108-150.000.

Cristofolo, Angelo R., to Johnson & Johnson Baby Products Company. Resealable package for premoistened towellettes. 4,428,477, Cl. 206-210.000.

Cronin, Dennis C., to Beloit Corporation. Extended nip shoe for a nip in a papermaking machine. 4,428,797, Cl. 162-358.000.

Croom, Michael: *See*—
Weingardt, Wilfred W., 4,428,577, Cl. 272-135.000.

Crow, William D., to Emerson Electric Co. Compartmentized lead wire terminal housing for electric motor. 4,429,243, Cl. 310-71.000.

Crumley, J. A.; and Weaver, John P., to AMP Incorporated. Means for decoding a switch array. 4,429,301, Cl. 340-365.00S.

Cseko, Christine: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,428,869, Cl. 252-522.00A.

Cummings, Paul W., Jr.; and Mailhot, David J., to Norton Co. Pipe support. 4,428,893, Cl. 261-122.000.

Cunningham, James L.; and Tatum, John M., to UOP Inc. Apparatus for spot annealing tubing. 4,428,563, Cl. 266-113.000.

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Curatolo, Benedict S.; and Coffey, Gerald P., to Standard Oil Company. Polyamides with high glass transition temperatures prepared from N,N'-terephthaloyldi-beta-alanine and a diamine. 4,429,109, Cl. 528-331.000.

Curtis, Tommie G.: *See*—
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Dahm, Jonathan C.; and Franka, John G., to Motorola, Inc. Process for improving nitride deposition on a semiconductor wafer. 4,428,975, Cl. 427-94.000.

Dahm, Manfred: *See*—
Jabs, Gert; Baatz, Gunther; Bock, Manfred; Dahm, Manfred; Haus, Artur; and Wegner, Christian, 4,428,978, Cl. 427-150.000.
Nehen, Ulrich; Hajek, Manfred; Weimann, Norbert; and Dahm, Manfred, 4,428,983, Cl. 427-213.340.

Daigler, Franklin A., to General Motors Corporation. Thermostatic valve assembly. 4,428,527, Cl. 236-34.500.

Daikin Kogyo Co., Ltd.: *See*—
Enjo, Naonori; and Aomi, Hideki, 4,428,854, Cl. 252-69.000.
Hisamoto, Iwao; Maeda, Chiaki; and Omure, Yukio, 4,428,851, Cl. 252-58.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Noller, Christoph, 4,428,347, Cl. 123-453.000.

Daiwa Seiko Inc.: *See*—
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Dale, Armand. Emergency descent device. 4,428,455, Cl. 182-7.000.

Dancsi, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.
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Daniel, Chelliah, to Ashland Oil, Inc. Manufacture of maleic anhydride. 4,429,136, Cl. 549-258.000.

Danko, Peter. Laminated wood products. 4,429,012, Cl. 428-12.000.

Dannelly, Clarence C.: *See*—
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Dantinne, Pierre G., to Cockerill Sambre. Apparatus for the continuous polishing and the uniform cooling of the face of a rolling mill work roll mounted in its stand. 4,428,164, Cl. 51-252.000.

Darko, Laszlo L.; Nakanishi, Koji; and Nakagawa, Masachi, to Richter Gedeon Vegyeszeti Gyar R.T. Physiologically active compounds and their isolation. 4,429,141, Cl. 549-382.000.

Data General Corporation: *See*—
Berube, Normand A.; Otavsky, Pavel; Hinlein, Sigmund; and Wiseley, Thomas, 4,429,336, Cl. 360-97.000.
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Fortescue, Stephen M., 4,429,307, Cl. 340-870.370.

Davco, Inc.: *See*—
Davis, Leland L., 4,428,351, Cl. 123-557.000.

Davidge, Roger W.; and Woodhead, James L., to United Kingdom Atomic Energy Authority. Ceramic materials by sol-gel route. 4,429,051, Cl. 501-12.000.

Davies, David R.; Richardson, Edwin A.; and Hagelaars, Adrianus M. P. M., to Shell Oil Company. Method of placing and consolidating a mass of particulate material and composition for use in carrying out said method. 4,428,426, Cl. 166-276.000.

Davies, Evan E.; and Nebrensky, Jiri R., to British Petroleum Company Limited, The. Separator for oil, gas and water. 4,428,839, Cl. 210-512.300.

Davies, Robert B.; and Miller, Ira, to Motorola, Inc. Switched current source for sourcing current to and sinking current from an output node. 4,429,270, Cl. 323-317.000.

Davies, Thomas D., to Davis Instruments Corporation. Optical device for vertically positioning a sextant. 4,428,671, Cl. 356-144.000.

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Davies, Thomas D., 4,428,671, Cl. 356-144.000.

Davis, James W.; and Dalbey, Michael E., to Fischer & Porter Company. Electrode wiring harness for magnetic flowmeter. 4,428,241, Cl. 73-861.120.

Davis, James W.; DuVall, Dale R.; and Kockler, Barry C., to Mead Corporation, The. Document scanning system. 4,429,333, Cl. 358-293.000.

Davis, Leland L., to Davco, Inc. Fuel processor apparatus. 4,428,351, Cl. 123-557.000.

Davis, Pauls: *See*—
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Davlin, Irwin H. Flange union with improved metal-to-metal seals. 4,428,603, Cl. 285-368.000.

Dawber, Stanley R. K.; and Fraser, Duncan J. Footwear and forming methods therefor. 4,428,089, Cl. 12-142.00R.

Dawson, Robert F.: *See*—
Casey, Paul G.; and Dawson, Robert F., 4,428,505, Cl. 222-64.000.

Day, John T.: *See*—
McNatt, Robert B.; and Day, John T., 4,428,568, Cl. 267-140.000.

Day, Joseph G., to Johnson Matthey & Co., Limited. Process for the recovery of platinum group metals from refractory ceramic substrates. 4,428,768, Cl. 75-10.00R.

Day, Pierce B., to Eastman Kodak Company. Color reproduction apparatus. 4,428,662, Cl. 355-4.000.

Dayco Corporation: *See*—
Mathieu, Julien C., 4,429,213, Cl. 219-301.000.

Deal, Philip A., to R. J. Reynolds Tobacco Company. Folding mechanism for use on a cartoning machine. 4,428,742, Cl. 493-142.000.

Dean, John R., to International Telephone and Telegraph Corporation. Printed circuit mounting apparatus especially for use in luminaires. 4,429,348, Cl. 361-399.000.

Dean, Robert M.: *See*—
Brindley, Robert J.; Taravella, Salvatore R.; and Dean, Robert M., 4,429,214, Cl. 219-345.000.

Deane, Kenneth E.; and Coulter, Robert S., to Emhart Industries, Inc. Timing mechanism. 4,429,195, Cl. 200-38.00A.

Dearborn Chemical Company: *See*—
Every, Richard L.; Lewandowski, Franklin D.; and Lech, Jerome F., 4,428,866, Cl. 252-500.000.

de Baan, Johannes J.; and Adrian, Adolf, to August Bilstein GmbH & Co. KG. Two-tube hydropneumatic shock absorber. 4,428,566, Cl. 267-64.150.

De Barbieri, Augusto, to Proter S.p.A. Compounds of dichlorodiethylaminophenylalanine with anti-tumor activity. 4,428,875, Cl. 260-112.50R.

Deere & Company: *See*—
Allen, James R.; Anderson, LaVerne, Jr.; and Leemans, Daniel L., 4,428,182, Cl. 56-14.600.
Anstey, Henry D., 4,428,282, Cl. 100-88.000.
Head, Glenn D., Jr.; Le Master, William C.; Bredesky, Louis P., Jr.; and Winter, David C., 4,428,214, Cl. 72-69.000.
Hubbard, Kevin L.; and Roth, Robert R., 4,428,435, Cl. 172-328.000.
Wohlford, William P., 4,428,625, Cl. 305-12.000.

Degussa Aktiengesellschaft: *See*—
Kunkel, Wolfgang; Kemnade, Jorg; and Schneider, Dietrich, 4,428,923, Cl. 423-588.000.

De-Gyves, Alejandro: *See*—
Dominguez-Ahedo, Carlos; Lopez-Ramos, Hector; De-Gyves, Alejandro; and Villarreal-Trevino, Juan A., 4,428,772, Cl. 75-91.000.

Dehnke, Mary K., to Dow Chemical Company, The. Ethylhydroxyalkylmethylcellulose ethers. 4,429,120, Cl. 536-91.000.

DeJager, James; and Ward, Leonard, to Storage Technology Corporation. Band positioning apparatus. 4,428,286, Cl. 101-111.000.

Dekkers, Leo P.; and Spencer, James R., to Midland-Ross Corporation. Electrical switch having a reciprocating wiping actuator. 4,429,201, Cl. 200-159.00A.

Delcoigne, Adrien: *See*—
Buck, Yves; and Delcoigne, Adrien, 4,428,898, Cl. 264-167.000.

Dellamano, Harry A.: *See*—
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Dellinger, Thomas B., to Mobil Oil Corporation. Method and apparatus for reducing the differential pressure sticking tendency of a drill string. 4,428,441, Cl. 175-61.000.

Delmastro, John A., to General Motors Corporation. Spare wheel carrier. 4,428,513, Cl. 224-42.210.

De Loach, Bernard C., Jr.; Miller, Richard C.; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Optical system for interrogation of the status of a switch. 4,429,231, Cl. 250-551.000.

Delta Dore S.A.: *See*—
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DeLuca, Hector F.; Schnoes, Heinrich K.; and Jorgensen, Neal A., to Wisconsin Alumni Research Foundation. Method of preventing milk fever in dairy cattle. 4,428,946, Cl. 424-236.000.

Delvaux, Andre L.: *See*—
Maes, Robert H.; Delvaux, Andre L.; and Lenoir, Pierre J., 4,428,731, Cl. 432-247.000.

Dempf, Josef: *See*—
Rosler, Helmut; Muhlbauer, Otto; Dempf, Josef; and Bigall, Klaus-Dieter, 4,428,267, Cl. 84-1.010.

Denes, Laszlo: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.

Denis, Phillippe, to Champion Spark Plug Europe S.A. Spacer for pivotally connecting wiper blade parts. 4,428,093, Cl. 15-250.420.

Denison, Philibert E., III; and Branecky, George, to Pitney Bowes Inc. Mail handling apparatus. 4,428,573, Cl. 271-305.000.

Denmar Engineering & Control Systems, Inc.: *See*—
Martin, Dennis R., 4,428,503, Cl. 221-232.000.

Dennison, David K.: *See*—
Kasik, James E.; Qurnell, Frank D.; and Dennison, David K., 4,428,903, Cl. 376-261.000.

Derbyshire, Frank J.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Liquefaction of coal. 4,428,818, Cl. 208-8.0LE.

Deschatrettes, Gerard; and Tirel, Rene, to Spicer, Glaenzer. Shaping machine. 4,428,163, Cl. 51-237.00M.

Deska, Theodore J.: *See*—
Morscheck, Timothy J.; Byar, Robert R.; and Deska, Theodore J., 4,428,469, Cl. 192-53.00E.

Deussner, Herbert; Herchenbach, Horst; Ramesohl, Hubert; and Breidenstein, Wolfgang, to Klockner-Humboldt-Deutz AG. Burner for solid fuels. 4,428,727, Cl. 431-182.000.

Devan, Joseph M., to United States of America, Navy. Flexi-bend corrugated waveguide. 4,429,290, Cl. 333-241.000.

Devinney, Edward J., Jr.: *See*—
Ruell, Hartwig; Devinney, Edward J., Jr.; and Chiu, Ming-Yee, 4,428,670, Cl. 356-71.000.

Devletian, Jack H.; Wood, William E.; Turpin, Robert B.; and Scholl, Milton R., to Southern Pacific Transportation Company. Method for welding railroad rails and means therefor. 4,429,207, Cl. 219-73.100.

DeVroom, William A., to American Hospital Supply Corporation. Manifold for monitoring hemodynamic pressure. 4,428,383, Cl. 128-748.000.

de Waard, Peter J., to U.S. Philips Corporation. Semiconductor laser having a doped surface zone. 4,429,396, Cl. 372-45.000.

de Wilde, Johannes, to U.S. Philips Corporation. Magnetic head unit having thermally dissipating cover plate. 4,429,337, Cl. 360-123.000.

Dholakia, Anil R., to RCA Corporation. Flip-flop grinding method. 4,428,165, Cl. 51-283.00R.

Diaz, Stephen H., to Raychem Corporation. Pleated heat-recoverable tape. 4,428,790, Cl. 156-86.000.

DiBianca, Frank A.; Pritzkow, Dennis H.; and Peterson, Thomas E., to General Electric Company. Solid state detector for CT comprising improvements in collimator plates. 4,429,227, Cl. 250-367.000.

Dickinson, Robert J., to Wagner, James L.; and Padnos, Dennis R., part interest to each. Fishing device. 4,428,144, Cl. 43-44.960.

Diczfalusy, Egon: *See*—
Archer, Sydney; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,428,947, Cl. 424-243.000.

Dietz, Milton S., to Polaroid Corporation. Method and apparatus for simultaneously evaluating different spectral frequencies from different scene zones. 4,428,654, Cl. 354-413.000.

DiGiacomo, Peter M.: *See*—
Dines, Martin B.; and DiGiacomo, Peter M., 4,429,111, Cl. 528-395.000.

Dines, Martin B.; and DiGiacomo, Peter M., to Occidental Research Corporation. Layered organophosphorus inorganic polymers containing mixed functional groups. 4,429,111, Cl. 528-395.000.

Dinger, Hans; and Klotz, Helmut, to MTU Friedrichshafen GmbH. Turbocharged internal combustion engine. 4,428,192, Cl. 60-606.000.

Dischert, Robert A.: *See*—
Oakley, Charles B.; and Dischert, Robert A., 4,429,327, Cl. 358-12.000.

DISCO Aluminum Products Company, Inc.: *See*—
Rinehart, David M., 4,428,154, Cl. 49-390.000.

Disteldorf, Josef; Hubel, Werner; and Broschinski, Lothar. Process for the preparation of primary mono- and diamines from oxo compounds. 4,429,157, Cl. 564-446.000.

Dittmer, William H.: *See*—
Wycoff, Keith H.; and Dittmer, William H., 4,429,279, Cl. 328-139.000.

Djerassi, Carl: *See*—
Archer, Sydney; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,428,947, Cl. 424-243.000.

Doderer, Earl S., to Trinity University. Apparatus and method for dehumidification systems. 4,428,205, Cl. 62-93.000.

Dohan, David: *See*—
Freadman, Tommyca, 4,429,181, Cl. 381-99.000.

Dombek, Bernard D.; and O'Connor, George L., to Union Carbide Corporation. Process for recovering volatile precious metals. 4,429,057, Cl. 518-710.000.

Dominguez-Ahedo, Carlos; Lopez-Ramos, Hector; De-Gyves, Alejandro; and Villarreal-Trevino, Juan A., to Hylsa, S.A. Method for reducing metal ore. 4,428,772, Cl. 75-91.000.

Don Lee Supply, Inc.: *See*—
Ratliff, Richard L., 4,428,328, Cl. 122-396.000.

Donaldson Company, Inc.: *See*—
McBroom, Kendall R.; and Shah, Dhanendra C., 4,428,834, Cl. 210-131.000.

Donaldson, Timothy P.; Neale, Christopher V.; and Menown, Hugh, to English Electric Valve Company Limited. Thyratrons. 4,429,253, Cl. 313-573.000.

Donbar, Ken W.: *See*—
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., 4,429,085, Cl. 526-92.000.

Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, to Farmitalia Carlo Erba S.p.A. Substituted pyrrolo[2,1-b]quinazolines and pyrido[2,1-b]quinazolines useful for the treatment of or the prevention of gastrointestinal ulcers. 4,428,952, Cl. 424-251.000.

Dorow, Joachim, to Albert-Frankenthal AG. Inking unit for a printing press. 4,428,291, Cl. 101-350.000.

Doty, Gerald A., to Gateway Industries, Inc. Tension release device with reduced door closing resistance. 4,428,600, Cl. 280-802.000.

Doubek, Edward R.; and Kasprzyk, Marlon Z., to Western Electric Company, Inc. Digital capacitance measuring test set and test circuit incorporated therein. 4,429,271, Cl. 324-60.0CD.

Douglas, Lawrence M., to Polaroid Corporation. Self-processing film unit with liquid applicator. 4,429,037, Cl. 430-499.000.

Dow Chemical Company, The: *See*—
Banks, Burke D., 4,428,126, Cl. 33-412.000.
Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., 4,428,805, Cl. 204-129.000.
Dehnke, Mary K., 4,429,120, Cl. 536-91.000.
Fry, William E., 4,428,863, Cl. 502-8.000.

Lee, George A.; and Hickner, Richard A., 4,428,807, Cl. 204-159.140.
Reifschneider, Walter, 4,429,125, Cl. 544-243.000.
Smith, Harry A., 4,428,754, Cl. 44-56.000.

Dow Corning Corporation: *See*—
Bartolo, Anthony J., 4,428,364, Cl. 128-1.00R.
Vincent, Gary A., 4,429,345, Cl. 361-315.000.

Down, Michael G.: *See*—
Phillips, D. Colin; Emmerich, Werner S.; Isenberg, Arnold O.; and Down, Michael G., 4,428,905, Cl. 376-323.000.

Doyle, Brian P.: *See*—
Oliver, Emerson T.; Doyle, Brian P.; and Marriner, Philip R., 4,428,317, Cl. 114-114.000.

Drachenberg, Franz: *See*—
Engelsberger, Ernst; Schulz, Ralf-Thilo; and Drachenberg, Franz, 4,428,157, Cl. 49-502.000.

Drake, Cyril F.; Maries, Alan; and Bateson, Paul F., to ITT Industries, Inc. Corrosion inhibiting paint compositions. 4,428,774, Cl. 106-14.390.

Drake, Marion R.: *See*—
Dubovick, Carol A.; and Drake, Marion R., 4,428,326, Cl. 119-102.000.

Dreier, Rainer, to Voest-Alpine Aktiengesellschaft. Discharge arrangement for removing green pellets out of a pelletizing arrangement. 4,428,831, Cl. 209-253.000.

Drent, Eit, to Shell Oil Company. Manufacture of ethylidene diacetate. 4,429,150, Cl. 560-232.000.

Dresen, William L.; Price, William F.; and Breezer, Harlan W., to Penda Corporation. Pallet. 4,428,306, Cl. 108-53.300.

Dresser Industries, Inc.: *See*—
Chatterjea, Probir K., 4,428,468, Cl. 192-13.00R.
McPhee, William A., 4,428,440, Cl. 175-4.600.
Smyrl, Kenneth E.; and Redd, Bobby G., 4,428,428, Cl. 166-278.000.

Dressler, John L.; Ganguly, Biswa N.; and VanBreemen, Bertram, to Mead Corporation. Method of fabricating a glass nozzle array for an ink jet printing apparatus. 4,429,322, Cl. 346-140.00R.

Dria, Dennis E.: *See*—
Blum, Patricia R.; Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,429,137, Cl. 549-259.000.

Drinkwater, Erroll H.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; Drinkwater, Erroll H.; and Laughman, Lanny M., 4,429,398, Cl. 372-64.000.

Dubovick, Carol A.; and Drake, Marion R. Infirmed pet ambulator. 4,428,326, Cl. 119-102.000.

Dubrovsky, Evgeny V.; Averkiev, Leonid A.; Dunaev, Viktor P.; Kuzin, Anatoly I.; Martynova, Natalya I.; Folts, Lev A.; Shmelev, Arthur P.; Vronsky, Sergei S.; and Vasiliev, Evgeny V. Tube-and-fin heat exchanger. 4,428,419, Cl. 165-151.000.

Duffy, Gifford R. Non-clogging eaves trough. 4,428,701, Cl. 405-119.000.

Dugan, William P., to General Dynamics, Pomona Division. Method and device for providing shaped electroformed parts using shrinkable tube members. 4,428,801, Cl. 204-9.000.

Dugge, Richard H., to ACF Industries, Incorporated. Permeable membrane seal assembly. 4,428,585, Cl. 277-12.000.

Duke, Alan H.; Hartung, Michael H.; and Marschner, Frederick J., to International Business Machines Corporation. Method and apparatus for managing data movements from a backing store to a caching buffer store. 4,429,363, Cl. 364-200.000.

Dunaev, Viktor P.: *See*—
Dubrovsky, Evgeny V.; Averkiev, Leonid A.; Dunaev, Viktor P.; Kuzin, Anatoly I.; Martynova, Natalya I.; Folts, Lev A.; Shmelev, Arthur P.; Vronsky, Sergei S.; and Vasiliev, Evgeny V., 4,428,419, Cl. 165-151.000.

Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,429,143, Cl. 549-450.000.
Barenberg, Sumner A., 4,429,067, Cl. 524-299.000.
Benin, Joshua; Mulholland, Kenneth L.; and Reichenberg, John F., 4,428,539, Cl. 242-18.00A.
Chambers, Vaughan C., Jr.; and Gervay, Joseph E., 4,429,027, Cl. 430-5.000.
Covington, Robert A., Jr.; Long, Cecil L.; and Williston, David W., 4,428,852, Cl. 252-62.560.
Gilmer, Thomas C., 4,429,066, Cl. 524-158.000.
Howell, Gary W., 4,428,511, Cl. 222-309.000.
Levy, Stanley B., 4,428,724, Cl. 425-446.000.
Rao, Velliyur Nott M., 4,429,055, Cl. 502-202.000.
Wells, John R., 4,428,323, Cl. 118-52.000.

Durette, Philippe L., to Merck & Co., Inc. Methyl 3-azido-4-C-cyano-2,3,4,6-tetradeoxy-α-D-arabino-hexopyranoside and processes for its preparation. 4,429,118, Cl. 536-17.200.

Durham, Edward E.: *See*—
Schweikert, John F.; Grossman, David S.; and Durham, Edward E., 4,428,343, Cl. 123-425.000.

Duro Dyne Corporation: *See*—
Hinden, Milton, 4,429,209, Cl. 219-98.000.

Durr-Dental GmbH & Co. KG: *See*—
Muller, Mathias, 4,428,777, Cl. 134-6.000.

DuVall, Dale R.: *See*—
Davis, James W.; DuVall, Dale R.; and Kockler, Barry C., 4,429,333, Cl. 358-293.000.

Dwan, William E.: *See*—
Julius, Robert P.; Dwan, William E.; and Tullar, Albert F., 4,428,497, Cl. 220-339.000.

Dye, Anthony O.; and Littlechild, David, to Epicam Limited. Inlet valve assembly for internal combustion engines. 4,428,336, Cl. 123-188.0VA.

Dynetics Engineering Corp.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., 4,429,217, Cl. 235-380.000.

E. R. Johnson Associates, Inc.: *See*—
Lennemann, William L., 4,428,700, Cl. 405-128.000.

Eagles, Brian A.; and Kelly, Jonathan S., to Coal Industry (Patents) Limited. Rotary cutter heads for mining machines. 4,428,619, Cl. 299-81.000.

Eastman Kodak Company: *See*—
Day, Pierce B., 4,428,662, Cl. 355-4.000.
Good, Raymond H.; and McBride, Paul, 4,429,158, Cl. 564-455.000.
Perlstein, Jerome H.; Reynolds, George A.; VanAllan, James A.; and Clark, Suzanne P., 4,429,030, Cl. 430-75.000.
Wu, Stephen H.; and Dannelly, Clarence C., 4,429,113, Cl. 528-486.000.

Eaton Corporation: *See*—
Anderson, Patrick J.; and Kenny, Andrew A., 4,428,393, Cl. 137-117.000.
Broucksou, Robert H.; Martin, George; and Outer, Richard J., 4,428,248, Cl. 74-335.000.
Glenn, Robert L.; and Smith, Jackson H., 4,429,200, Cl. 200-153.00T.
Jaeschke, James R.; and Rutchik, Walter L., 4,429,339, Cl. 361-93.000.
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Schachameyer, Steven R., 4,428,986, Cl. 427-309.000.
Stahly, Daniel C.; and Kenny, Andrew A., 4,428,353, Cl. 123-568.000.
Young, Robert A., 4,428,247, Cl. 74-331.000.

Ebauches S.A.: *See*—
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Eberie, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case. 4,429,208, Cl. 219-78.160.

Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., to R. P. Scherer Corporation. Masticatory soft elastic gelatin capsules and method for the manufacture thereof. 4,428,927, Cl. 424-37.000.

Eblen, Ewald: *See*—
Banzhaf, Werner; Brenner, Klaus; and Eblen, Ewald, 4,428,228, Cl. 73-119.00A.

Eby, Richard R., to Sperry Corporation. Method of forming a cutting edge. 4,428,260, Cl. 76-104.00R.

Eccardt, Curtis J., to Emerson Electric Co. Feed mechanism for a power tool. 4,428,520, Cl. 226-141.000.

Eckardt AG: *See*—
Bader, Horst, 4,428,391, Cl. 137-84.000.

Eckhardt, Wolfgang: *See*—
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Edelson, Richard L., to Bourke, Frederic A., Jr.; Bourke, Eleanor F.; Edelson, Richard L.; and Edelson Trust, The. Method and system for externally treating the blood. 4,428,744, Cl. 604-6.000.

Edelson Trust, The: *See*—
Edelson, Richard L., 4,428,744, Cl. 604-6.000.

Edison Price, Incorporated: *See*—
Price, Edison A., 4,428,696, Cl. 403-168.000.

Edwards, Christopher H., to Trafftrans (Proprietary) Limited. Traffic accessory. 4,428,990, Cl. 428-41.000.

Edwards, David G., to Siemens Corporation. Fingerprint sensor. 4,429,413, Cl. 382-4.000.

EECO Incorporated: *See*—
Pargee, Robert W., Jr., 4,429,332, Cl. 358-143.000.

Eggels, Adriana G. M.: *See*—
Verberne, Wim M. J. C.; and Eggels, Adriana G. M., 4,428,803, Cl. 204-43.00Z.

Egli, Alwin, to SIG Schweizerische Industrie-Gesellschaft. Tear-open closure for a double bag. 4,428,485, Cl. 206-604.000.

Ehrlinger, Friedrich: *See*—
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Eilerman, Robert G.; Willis, Brian J.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. Perfume composition containing phenylethynyl carbinols. 4,428,870, Cl. 252-522.00R.

Eisele, Walter H.; Krueger, Helmut H. A.; Lajos, Robert E.; and Koneval, Donald J., to Gould Inc. Geometric balance adjustment of thin film strain gage sensors. 4,428,976, Cl. 427-96.000.

Eisenhart, Robert L.: *See*—
Robertson, Ralston S., Jr.; and Eisenhart, Robert L., 4,429,287, Cl. 331-107.0DP.

El Paso Products Company: *See*—
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Electric Power Research Institute, Inc.: *See*—
Clemens, Donald D.; Larson, Elmer M., Jr.; Morgan, William T.; Steele, Oliver P., III; and Wright, Fred R., 4,429,329, Cl. 358-100.000.
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Electricity Council, The: *See*—
Walker, David J.; and Amor, Kenneth, 4,428,782, Cl. 148-129.000.
Elevators Pty. Limited: *See*—
Luinstra, Marco F., 4,428,460, Cl. 187-1.00R.
Elf, Jennifer L. Infant carrier. 4,428,514, Cl. 224-151.000.
Ellcon-National, Inc.: *See*—
Beacon, Robert G., 4,428,622, Cl. 303-84.00R.
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Williams, Ronald H.; Elliott, Mason T.; and Moss, Leonard S., 4,428,280, Cl. 99-356.000.
Elliott, Mason Thomas: *See*—
Williams, Ronald H.; Elliott, Mason T.; and Moss, Leonard S., 4,428,280, Cl. 99-356.000.
Ellman, Barry R. Surgical bag for splenorrhaphy. 4,428,375, Cl. 128-334.00R.
Ellwood, John R.: *See*—
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Elmore, Jimmy D.: *See*—
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Elscint, Inc.: *See*—
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Elsohly, Mahmoud; Watson, Edna S.; and Waller, Coy W., to University of Mississippi, The. Tolerizing and desensitizing compounds, compositions and methods of treatment against dermatological conditions caused by allergens from plants and trees of the Anacardiaceae and Ginkgoaceae families. 4,428,965, Cl. 424-311.000.
Emain, Jean, to S.A. Vve Henry Chebassus. Hinge elements for spectacles comprising a friction ring. 4,428,094, Cl. 16-228.000.
Ember, Julia: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.
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Garnett, Willard R., 4,429,354, Cl. 362-342.000.
Emerson, Kenneth R.; and Haworth, Diane, to S. C. Johnson & Sons, Inc. Dispensing device for continuous aerosol. 4,428,509, Cl. 222-153.000.
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Engel, John F., to FMC Corporation. 4-Phenyl-2-indanyl esters of 1R,cis-3-(2-halo-3,3,3-trifluoropropenyl)-2,2-dimethylcyclopropanecarboxylic acid. 4,429,149, Cl. 560-124.000.
Engelsberger, Ernst; Schulz, Ralf-Thilo; and Drachenberg, Franz, to Messerschmitt-Boelkow-Blohm GmbH. Door especially for motor vehicles. 4,428,157, Cl. 49-502.000.
Engineering Specialties, Inc.: *See*—
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England, David C.: *See*—
Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,429,143, Cl. 549-450.000.
English, Anthony J.: *See*—
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English Electric Valve Company Limited: *See*—
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Enjo, Naonori; and Aomi, Hideki, to Daikin Kogyo Co., Ltd. Absorption refrigerant compositions for use in absorption refrigeration systems. 4,428,854, Cl. 252-69.000.
Epicam Limited: *See*—
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Erdelsky, Joseph J., to Robertshaw Controls Company. Outlet coupling member for a propellant storage construction and method of making the same. 4,428,560, Cl. 251-149.100.
Erhard, Werner, to Muller-Dutschke, Helga. Electronic ignition device for combustion engines. 4,428,333, Cl. 123-149.00C.
Eriksson, Albert: *See*—
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Ethicon Inc.: *See*—
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Evans, Frank, to British Nuclear Fuels Limited. Hydraulic discharge system. 4,428,836, Cl. 210-189.000.
Evans, Hugh G.; Speer, Stephen; and Christy, James S. Vibration-insulating stability improving torque force device. 4,428,550, Cl. 244-93.000.
Evans, Thomas L.; and Grade, Marsha M., to General Electric Company. Novel sulfur-containing polyetherimides. 4,429,102, Cl. 528-172.000.
Everett, Charles K.: *See*—
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Every, Richard L.; Lewandowski, Franklin D.; and Lech, Jerome F., to Dearborn Chemical Company. Composition for reducing fly ash resistivity. 4,428,866, Cl. 252-500.000.
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Kalokhe, Shivdas, 4,428,704, Cl. 408-156.000.
Excelermatic Inc.: *See*—
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Lee, Kyu H.; and Porter, Christopher H., 4,428,403, Cl. 138-130.000.
Extramet: *See*—
Bienvenu, Gerard, 4,428,894, Cl. 264-9.000.
Exxon Research & Engineering Company: *See*—
Baset, Zeinab H., 4,428,821, Cl. 208-11.0LE.
Teng, Harry H.; and Huang, I-Der, 4,429,174, Cl. 585-426.000.
Wisotsky, Max J., 4,428,849, Cl. 252-33.400.
Fahmy, Mohamed A., to Rhone-Poulenc Agrochimie. O-Alkyl S-(tertiary alkyl) alkylphosphonothioate insecticides and nematocides. 4,428,945, Cl. 424-222.000.
Fair, Gary R. Precision vertical registration adjustment device for a printing press. 4,428,289, Cl. 101-248.000.
Fairchild Camera and Instrument Corporation: *See*—
Milgram, Alvin, 4,428,796, Cl. 156-637.000.
Falk, Robert A.: *See*—
Cooke, Thomas W.; and Falk, Robert A., 4,429,162, Cl. 568-50.000.
Falkowski, Edmund W.; and Kolasa, Michael J., to United States of America, Army. Finless gun-fired practice round. 4,428,294, Cl. 102-444.000.
Farazi, Perry; and Frank, Howard L., to Sun Electric Corporation. Apparatus and method for testing of a rotary movement-electrical signal transducer system. 4,428,224, Cl. 73-2.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,428,952, Cl. 424-251.000.
Farr, Glyn P. R., to Lucas Industries Limited. Anti-skid braking systems for vehicles. 4,428,624, Cl. 303-116.000.
Faste, Rolf A.: *See*—
Peckham, Arthur C.; Faste, Rolf A.; and Peckham, Arthur C., Jr., 4,428,369, Cl. 128-80.00C.
Fatula, James J., Sr., to Ryman Engineering Company. Method and apparatus for grinding irregular surfaces. 4,428,158, Cl. 51-33.00R.
Favret, Uncas B., Jr., to Engineering Specialties, Inc. Offshore pollution prevention. 4,428,841, Cl. 210-747.000.
Favron, Emile H. Automatic chorder for stringed instruments. 4,428,273, Cl. 84-317.000.
Feagle, Hugh B., to Hayes International Corporation. Airborne target for generating an exhaust plume simulating that of a jet powered aircraft. 4,428,583, Cl. 273-348.100.
Feasey, Ronald G., to Imperial Chemical Industries PLC. Prepration of shaped articles of intractable polymers. 4,429,104, Cl. 528-206.000.
Featherstone, John L.: *See*—
McCabe, Barkman C.; Zajac, Edward; and Featherstone, John L., 4,428,200, Cl. 60-641.500.
Fecitt, Graham J., to Coal Industry (Patents) Limited. Mining machine control signal processing system. 4,428,618, Cl. 299-1.000.
Feess, Erich: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; Schon, Franz; and Feess, Erich, 4,428,750, Cl. 8-461.000.
Fehr, Charles, to Firmenich SA. Process for the preparation of rose oxide. 4,429,139, Cl. 549-356.000.
Feichtinger, Gerhard: *See*—
Skatsche, Othmar; Feichtinger, Gerhard; Melde-Tuczai, Helmut; and Schukoff, Bruno, 4,428,338, Cl. 123-198.00E.
Felber, Betty J.; and Christopher, Charles A., to Standard Oil Company. Method for sweep improvement utilizing gel-forming lignins. 4,428,429, Cl. 166-294.000.
Felbermayer, Erich: *See*—
Scheurecker, Werner; Felbermayer, Erich; and Nagl, Alfred, 4,428,415, Cl. 164-448.000.
Feldman, Steven, to AMP Incorporated. Piezoelectric transducer supporting and contacting means. 4,429,247, Cl. 310-322.000.
Feldt, Wolfgang; and Bautz, Walter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Grinding machine and control for removing burrs or fins from workpieces such as castings. 4,428,162, Cl. 51-165.770.
Felix, Raymond A., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,429,124, Cl. 544-214.000.
Felt Products Mfg. Co.: *See*—
Pearlstein, Robert S., 4,428,593, Cl. 277-235.00B.

Fendt, Alfons: *See—*
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,429,338, Cl. 361-42.000.

Fergason, Virgil L.: *See—*
Wurzburg, Otto B.; and Fergason, Virgil L., 4,428,972, Cl. 426-578.000.

Ferraro, Frank A.: *See—*
Chen, Evan N.; and Ferraro, Frank A., 4,428,116, Cl. 30-87.000.

Ferreira, Robert: *See—*
Rice, Robert; and Ferreira, Robert, 4,428,601, Cl. 285-197.000.

Field, Thomas R., to Jenn-Air Corporation. Self-ventilated range and method of installing. 4,428,357, Cl. 126-299.00R.

Fikkers, John T. Window bracket support and scaffolding for building exterior. 4,428,457, Cl. 182-55.000.

Finck, Herbert; and Reisinger, Konrad, to Siemens Aktiengesellschaft. Method for seizing time slots of a time-division multiplex system with dynamic multiplexers. 4,429,383, Cl. 370-84.000.

Findl, Eugene; and Milch, Peter O., to Kurtz, Alfred B.; and Kurtz, Robert J. Electromagnetic apparatus and method for the reduction of serum glucose levels. 4,428,366, Cl. 128-15.000.

Fiore, Joseph; and Hoffman, Louis S., to Turbo Inc. Foldable ladder. 4,428,458, Cl. 182-116.000.

Firestone Tire & Rubber Company, The: *See—*
Hall, James E., 4,429,090, Cl. 526-177.000.
Hall, James E., 4,429,091, Cl. 526-181.000.

Firmenich SA: *See—*
Fehr, Charles, 4,429,139, Cl. 549-356.000.

Fischer, Bruno; and Andretta, Angelo, to Micafil AG. Apparatus for connecting the ends of stator windings to the stator supply terminals. 4,428,113, Cl. 29-736.000.

Fischer, Peter: *See—*
Pietryk, Erwin; Fischer, Peter; and Rauthmann, Axel, 4,428,533, Cl. 239-284.00R.

Fischer & Porter Company: *See—*
Davis, James W.; and Dalbey, Michael E., 4,428,241, Cl. 73-861.120.

Fischer, Robert L., to Caterpillar Tractor Co. Lock pin assembly. 4,428,255, Cl. 74-813.00L.

Fischer, Werner K.; Keller, Felix; and Hanni, Max, to Swiss Aluminium Ltd. Process for mixing and cooling electrode material. 4,428,679, Cl. 366-141.000.

Fisher, Ernest P., Jr.: *See—*
Yonker, John H.; and Fisher, Ernest P., Jr., 4,428,557, Cl. 251-62.000.

Fisher, James L., Jr. Suspended cycle riding device. 4,428,576, Cl. 272-33.00R.

Fisher, Robert D.: *See—*
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., 4,429,217, Cl. 235-380.000.

Fister, Julius C.: *See—*
Breedis, John F.; and Fister, Julius C., 4,429,022, Cl. 428-675.000.

Flachbarth, Charles T.; and Benscoter, Richard D., to Butler Manufacturing Company. Cable coupler/wiring adaptor. 4,428,641, Cl. 339-205.000.

Fletcher Industries Limited, The: *See—*
Reay, Alan, 4,428,167, Cl. 52-72.000.

Fletcher, Taylor C.; and Flora, Neal P. Data analyzing system for clinical spectrophotometer. 4,429,373, Cl. 364-900.000.

Fliervoet, Maria J. H.: *See—*
Lambot, Honore J.; Fliervoet, Maria J. H.; and Kramer, Pieter, 4,428,602, Cl. 285-239.000.

Fling, Thomas A. Tube bender. 4,428,216, Cl. 72-156.000.

Flora, Neal P.: *See—*
Fletcher, Taylor C.; and Flora, Neal P., 4,429,373, Cl. 364-900.000.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Lai Chen, Sow-Mei, to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-substituted prostanoic acids and congeners. 4,429,148, Cl. 560-118.000.

FMC Corporation: *See—*
Engel, John F., 4,429,149, Cl. 560-124.000.
Hopkins, Quentin G., 4,428,922, Cl. 423-588.000.

Focht, Louis R., to Ford Motor Company. Engine knock anticipation. 4,428,344, Cl. 123-425.000.

Focke & Co.: *See—*
Focke, Heinz H.; and Liedtke, Kurt, 4,428,177, Cl. 53-170.000.

Focke, Heinz H.; and Liedtke, Kurt, to Focke & Co. Cigarette packaging apparatus with radial transfer. 4,428,177, Cl. 53-170.000.

Foley, James W.: *See—*
Cournoyer, Richard L.; and Foley, James W., 4,429,142, Cl. 549-394.000.

Foley, John S.: *See—*
Carstens, Jeffrey P.; Blaszuk, Paul R.; and Foley, John S., 4,429,211, Cl. 219-121.0LC.

Folger, Russell F.; and Wasik, Henry J., to Timken Company, The. Sealed bearing and self-venting seal therefor. 4,428,630, Cl. 308-187.200.

Follows, James S., to Vanguard Plastics Ltd. Latching drop lock for sliding closure member. 4,428,605, Cl. 292-152.000.

Folts, Lev A.: *See—*
Dubrovsky, Evgeny V.; Averkiev, Leonid A.; Dunaev, Viktor P.; Kuzin, Anatoly I.; Martynova, Natalya I.; Folts, Lev A.; Shmelev, Arthur P.; Vronsky, Sergei S.; and Vasiliev, Evgeny V., 4,428,419, Cl. 165-151.000.

Forch, Hans, to Carl Freudenberg, Firma. Seal ring with channel for radially accelerating medium to be sealed. 4,428,587, Cl. 277-25.000.

Ford Motor Company: *See—*
Focht, Louis R., 4,428,344, Cl. 123-425.000.
Pietryk, Erwin; Fischer, Peter; and Rauthmann, Axel, 4,428,533, Cl. 239-284.00R.

Forenade Fabriksverken: *See—*
Oskar, Ramnesten I., 4,428,220, Cl. 72-370.000.
Ramnesten, Ivan O., 4,428,222, Cl. 72-479.000.

Formax, Inc.: *See—*
Lindee, Scott A.; and Sandberg, Glenn A., 4,428,263, Cl. 83-354.000.

Fortescue, Stephen M., to Dataproducts Corporation. Capacitive transducer with continuous sinusoidal output. 4,429,307, Cl. 340-870.370.

Foshee, William R.; and Carey, Kevin L., to Best Lock Corporation. Tool-loadable biasing spring. 4,428,570, Cl. 267-164.000.

Foshee, William R.: *See—*
Best, Walter E.; and Foshee, William R., 4,428,212, Cl. 70-224.000.

Fournales France: *See—*
Fournales, Jean P., 4,428,567, Cl. 267-64.260.

Fournales, Jean P., to Fournales France. Combined shock absorbent and suspension for vehicle. 4,428,567, Cl. 267-64.260.

Franchini, Carlo: *See—*
Belleau, Bernard R.; and Franchini, Carlo, 4,428,889, Cl. 260-927.00R.

Frank, Dieter; and Metcalfe, Lincoln D., to Akzona Incorporated. Magnetic recording medium. 4,429,023, Cl. 428-694.000.

Frank, Earl E.; and Yee, Bing S., to Abex Corporation. Railroad switch machine. 4,428,552, Cl. 246-393.000.

Frank, Howard L.: *See—*
Farazi, Perry; and Frank, Howard L., 4,428,224, Cl. 73-2.000.

Franka, John G.: *See—*
Dahm, Jonathan C.; and Franka, John G., 4,428,975, Cl. 427-94.000.

Franke, Albrecht; Steiner, Gerd; Thieme, Peter C.; Lenke, Dieter; Gries, Josef; and Teschendorf, Hans-Juergen, to BASF Aktiengesellschaft. (Hetarylphenoxy)-(phenylpiperazinyl)-propanols, their preparation and drugs containing these compounds. 4,428,950, Cl. 424-250.000.

Franklin, Robert P., to Trans-World Manufacturing Corporation. Adjustable multi-bay display. 4,428,136, Cl. 40-605.000.

Fraser, Duncan J.: *See—*
Dawber, Stanley R. K.; and Fraser, Duncan J., 4,428,089, Cl. 12-142.00R.

Freadman, Tommyca, to Dohan, David, a part interest. Audio system. 4,429,181, Cl. 381-99.000.

Fredriksson, John I.; Morrow, John D.; and Rossi, Giulio A., to Norton Co. Protective coating for porous refractories. 4,429,003, Cl. 428-317.900.

French Oil Mill Machinery Co., The: *See—*
Barger, William M., 4,428,833, Cl. 210-113.000.

Freud, Paul J., to Leeds & Northrup Company. Humidity sensing element. 4,429,343, Cl. 361-286.000.

Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Egon; and Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. Benzopyran compounds, pharmaceutical compositions containing them and methods of use. 4,428,955, Cl. 424-267.000.

Fried, Josef: *See—*
Archer, Sydney; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,428,947, Cl. 424-243.000.

Friedman, Robert H., to Getty Oil Company. Consolidatable gravel pack method. 4,428,427, Cl. 166-278.000.

Friedrichs, Josef: *See—*
Stiefel, Christian; Friedrichs, Josef; Marsella, Gino; and Kahle, Horst, 4,428,565, Cl. 267-9.00A.

Friese, Axel; and Simon, Stefan. Tampon blister pack. 4,428,747, Cl. 604-12.000.

Fritz Reinke Engineering: *See—*
Reinke, Fritz, 4,428,791, Cl. 156-161.000.

Fritzsche Dodge & Olcott Inc.: *See—*
Eilerman, Robert G.; Willis, Brian J.; and Yurecko, John M., Jr., 4,428,870, Cl. 252-522.00R.

Frohberger, Paul-Ernst: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,428,949, Cl. 424-245.000.

Fromer, Shmuel. Rotary engine. 4,428,339, Cl. 123-245.000.

Fry, William E., to Dow Chemical Company, The. Alumina compositions of improved strength useful as catalyst supports. 4,428,863, Cl. 502-8.000.

Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrrolo[3,4-d][2]benzazepines. 4,428,878, Cl. 260-245.700.

Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrrolo[3,4,-d][2]benzazepines. 4,428,879, Cl. 260-245.700.

Fuji Electric Co., Ltd.: *See—*
Fumoto, Takabumi; and Sawaguchi, Mutsuo, 4,429,225, Cl. 250-353.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Kodama, Masayuki; and Takano, Toshio, 4,428,253, Cl. 74-688.000.

Fuji Photo Film Co., Ltd.: *See—*
Hirano, Shigeo; and Takagi, Yoshihiro, 4,429,036, Cl. 430-405.000.
Kato, Eiichi; Ohki, Nobutaka; and Ogawa, Junkichi, 4,429,035, Cl. 430-402.000.
Noguchi, Masaru, 4,429,220, Cl. 250-236.000.
Ochiai, Takeji, 4,429,039, Cl. 430-534.000.
Ogawa, Hiroshi; and Tamai, Yasuo, 4,429,017, Cl. 428-463.000.
Ohtsuka, Shuichi, 4,429,323, Cl. 346-153.100.

Okita, Tsutomu; Naruo, Kyoichi; and Ushimaru, Akira, 4,428,974, Cl. 427-44.000.
Tsubota, Motohiko; Morigaki, Masakazu; Hamaoka, Tsutomu; and Ohki, Nobutaka, 4,429,031, Cl. 430-218.000.
Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, 4,429,050, Cl. 436-538.000.

Fuji Xerox Co., Ltd.: *See—*
Matsumoto, Sinji, 4,428,660, Cl. 355-3.0FU.
Mita, Tsunemasa, 4,428,690, Cl. 400-120.000.
Tamai, Masayoshi; and Iyoda, Tetsuo, 4,429,315, Cl. 346-75.000.

Fujieda, Kazumasa: *See—*
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Fujii, Tadaaki: *See—*
Masuda, Naosuke; Tobisawa, Yoshio; and Fujii, Tadaaki, 4,428,399, Cl. 137-625.220.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Hata, Takehisa; Nishimura, Kenichi; and Yasumura, Mitsuru, 4,428,951, Cl. 424-250.000.
Ueda, Ikuo; Kato, Masayuki; and Nagano, Masanobu, 4,429,126, Cl. 544-250.000.

Fujita, Masanori, to Seikosha Co., Ltd. Display driving device. 4,429,304, Cl. 340-765.000.

Fujita, Tsutomu: *See—*
Ida, Jinsei; Hagimoto, Yoshio; and Fujita, Tsutomu, 4,428,256, Cl. 74-820.000.

Fujitani, Kango: *See—*
Murai, Koichi; Kobayashi, Toshiaki; and Fujitani, Kango, 4,429,140, Cl. 549-370.000.

Fujitsu Limited: *See—*
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,429,388, Cl. 371-21.000.
Ito, Akihiko; Kobayashi, Kazuhiro; Tanaka, Hisami; and Ueno, Norio, 4,429,281, Cl. 330-9.000.
Yamasawa, Masao; and Soejima, Tetsuo, 4,429,300, Cl. 340-347.0DD.

Fujiwara, Shinobu: *See—*
Masuda, Keiji; Fujiwara, Shinobu; and Matsumoto, Kenichi, 4,428,661, Cl. 355-3.0DD.

Fukada, Shunsuke; Aihara, Kiyoshi; and Ibaragi, Hideo, to Toray Industries, Inc. Bulky non-woven fabric of polybutylene terephthalate continuous filaments. 4,429,002, Cl. 428-287.000.

Fukasaku, Yoshinori: *See—*
Hayashibara, Toshio; Noto, Kunihiro; and Fukasaku, Yoshinori, 4,428,719, Cl. 417-354.000.

Fukuma, Daizo: *See—*
Suzuki, Shigeru; Fukuma, Daizo; and Shirota, Kensho, 4,428,785, Cl. 149-19.400.

Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, to Fujitsu Limited. Field programmable device with internal dynamic test circuit. 4,429,388, Cl. 371-21.000.

Fumoto, Takabumi; and Sawaguchi, Mutsuo, to Fuji Electric Co., Ltd. Infrared thickness measuring device. 4,429,225, Cl. 250-353.000.

Funabashi, Tadao: *See—*
Inui, Kenichi; Kobayashi, Hisao; and Funabashi, Tadao, 4,429,356, Cl. 363-56.000.

Funk, Albert G.: *See—*
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Furmanite International Limited: *See—*
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Furtwangler, Hans-Rolf: *See—*
Koebernick, Wolfgang; and Furtwangler, Hans-Rolf, 4,429,117, Cl. 536-17.200.

Furukawa, Isokazu: *See—*
Umezawa, Michio; Naruse, Osamu; Furukawa, Tatsuya; Ohori, Tamio; Furukawa, Isokazu; and Kakeno, Sadao, 4,429,317, Cl. 346-75.000.

Furukawa, Tatsuya: *See—*
Umezawa, Michio; Naruse, Osamu; Furukawa, Tatsuya; Ohori, Tamio; Furukawa, Isokazu; and Kakeno, Sadao, 4,429,317, Cl. 346-75.000.

Furuya, Katusuke, to Laurel Bank Machine Co., Ltd. Counting circuit for coin counting device. 4,429,407, Cl. 377-7.000.

G. D. Searle & Co.: *See—*
Krzeminski, Melvin L., 4,428,371, Cl. 128-130.000.

G. W. Haab Co., Inc.: *See—*
Haab, Gordon W., 4,428,175, Cl. 53-55.000.

Gaetani, Frank J.: *See—*
Zoleski, Benjamin H.; and Gaetani, Frank J., 4,428,850, Cl. 252-42.700.

GAF Corporation: *See—*
Liu, Kou-Chang, 4,429,146, Cl. 560-21.000.

Gaillard, Michel: *See—*
Bertrand, Jean; and Gaillard, Michel, 4,429,098, Cl. 528-59.000.

Gaku, Morio; Nagai, Syunichi; Kimpara, Hidenori; and Ayano, Satoshi, to Mitsubishi Gas Chemical Co., Inc. Process of delaying cure of curable resin composition containing cyanate ester compound with benzene sulfonic acid compound. 4,429,112, Cl. 528-422.000.

Galambos, Janos: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Keve, Tibor; Dancsi, Lajos; Galambos, Janos; Vezekenyi, Ferenc; and Acs, Tibor, 4,429,129, Cl. 546-70.000.

Gale, Glen R.: *See—*
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Galibert, Francis; Tiollais, Pierre; and Charnay, Patrick, to Institut Pasteur; and Institut National de la Sante et de la Recherche Medicale. Nucleotidic sequence coding the surface antigen of the hepatitis B virus, vector containing said nucleotidic sequence, process allowing the obtention thereof and antigen obtained thereby. 4,428,941, Cl. 424-177.000.

Gallay, Jean J.: *See—*
Boray, Joseph C.; Gallay, Jean J.; and Sarasin, Gedeon, 4,428,957, Cl. 424-270.000.

Gambro Dialysatoren KG: *See—*
Heck, Wolfgang, 4,428,743, Cl. 604-4.000.

Gancy, Alan B. Controlled density hydraulic fluids. 4,429,065, Cl. 523-223.000.

Gange, Robert A., to RCA Corporation. Line cathode support structure for a flat panel display device. 4,429,251, Cl. 313-411.000.

Ganguly, Biswa N.: *See—*
Dressler, John L.; Ganguly, Biswa N.; and VanBreemen, Bertram, 4,429,322, Cl. 346-140.00R.

Ganz, Jorg, to Sig Societe Industrielle Suisse. Railway track tamping machine. 4,428,297, Cl. 104-12.000.

Garagnani, Enea: *See—*
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,429,064, Cl. 523-213.000.

Garchinsky, John S., to Union Metal Manufacturing Company. Luminaire raising and lowering system. 4,429,355, Cl. 362-403.000.

Garcia, Alfred B.: *See—*
Wovcha, Merle G.; Knight, John C.; and Garcia, Alfred B., 4,429,041, Cl. 435-58.000.

Gardikas, Paul T.; and Bailey, Daniel W. Athletes water bottle. 4,428,508, Cl. 222-153.000.

Garnett, Willard R., to Emerson Electric Co. Lighting fixture louver. 4,429,354, Cl. 362-342.000.

Garrett Corporation, The: *See—*
Stokes, Richard F.; Timm, James D.; LaCroix, Stephen R.; and Adams, Milton R., 4,428,194, Cl. 60-39.020.

Gartner, Todd H., to GTE Automatic Electric Inc. Floating battery feed circuit for telephone subscriber line interface. 4,429,186, Cl. 179-77.000.

Gasparovic, George M.: *See—*
Tyler, David O.; and Gasparovic, George M., 4,429,249, Cl. 313-113.000.

Gates Rubber Company, The: *See—*
Stuemky, Robert E., 4,429,018, Cl. 428-546.000.

Gateway Industries, Inc.: *See—*
Doty, Gerald A., 4,428,600, Cl. 280-802.000.

Gatland, Kenneth: *See—*
Tedd, David C.; and Gatland, Kenneth, 4,429,202, Cl. 200-324.000.

Gau, George; and Pesold, Erwin, to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik. Apparatus for the alignment of bottles or the like, particularly labeling machines. 4,428,474, Cl. 198-394.000.

Gay, Michael J., to Motorola, Inc. Combined phase detector and low pass filter. 4,429,239, Cl. 307-520.000.

Gayler, Rudolf: *See—*
Muller, Hans; Gayler, Rudolf; and Rapsomanikis, Nikolas, 4,428,969, Cl. 426-53.000.

Gearhart Industries, Inc.: *See—*
Terrell, Jamie B., I; and Terrell, Jamie B., II, 4,428,430, Cl. 166-298.000.

Gebhart, John R.; and Ledoux, Francis X., to United Technologies Corporation. 360° View camera. 4,428,656, Cl. 354-80.000.

Gebr. Happich GmbH: *See—*
Viertel, Lothar; and Wrintmore, Alan, 4,428,612, Cl. 296-97.00K.

Geiersbach, Allois F.; and Gilmore, Thomas P., to Allis-Chalmers Corporation. Electrode arrangement for electric weed killing apparatus. 4,428,150, Cl. 47-1.300.

Gelaude, Jonathon L. Automatic fire protection system. 4,428,434, Cl. 169-13.000.

Gelhard, Manfred, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Spreading dowel for securing an insert in a panel with the aid of the dowel. 4,428,705, Cl. 411-82.000.

Gelinas, Raymond C., to Honeywell Inc. Apparatus and method for demodulation of a modulated curl-free magnetic vector potential field. 4,429,280, Cl. 329-200.000.

Gelinas, Raymond C., to Honeywell Inc. Apparatus and method for modulation of a curl-free magnetic vector potential field. 4,429,288, Cl. 332-51.00R.

General Battery Corporation: *See—*
Eberle, William J., 4,429,208, Cl. 219-78.160.

General Dynamics Corporation: *See—*
Abbott, Johnnie G.; and Brown, Ralph V., 4,428,105, Cl. 29-149.50B.

General Dynamics, Pomona Division: *See—*
Dugan, William P., 4,428,801, Cl. 204-9.000.

General Electric Company: *See—*
Anderson, Thomas E., 4,429,359, Cl. 363-132.000.
DiBianca, Frank A.; Pritzkow, Dennis H.; and Peterson, Thomas E., 4,429,227, Cl. 250-367.000.
Evans, Thomas L.; and Grade, Marsha M., 4,429,102, Cl. 528-172.000.
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Kasik, James E.; Qurnell, Frank D.; and Dennison, David K., 4,428,903, Cl. 376-261.000.
Keane, John J.; and Zopf, Richard F., 4,429,034, Cl. 430-271.000.
Kim, Manjin J.; and Chow, Tat-Sing P., 4,429,011, Cl. 428-450.000.
Ohno, John M., 4,428,755, Cl. 51-307.000.
Pauze, Denis R.; and Hughes, Raymond B., 4,429,073, Cl. 524-600.000.

Peterson, Marvin A., 4,428,977, Cl. 427-120.000.
General Foods Corporation: *See—*
Laudano, Raymond J., 4,428,970, Cl. 426-385.000.
General Kinematics Corporation: *See—*
Kraus, Richard B.; and Musschoot, Albert, 4,428,476, Cl. 198-764.000.
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Grisebach, Hans T.; Betzing, Rudolf; Betzing, Volker; Betzing, Ulrich; and Betzing, Klaus. Manipulator with a swivel jib. 4,428,710, Cl. 414-590.000.
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Gruzling, Joe; Johansson, Bengt; Keinonen, Arno; Revill, Colin; and Laskow, Vlodek, to Arctic Pilot Project Inc. Propeller mount for icebreaker. 4,428,735, Cl. 440-76.000.
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Guch, Steve, Jr., to GTE Products Corporation. Conduction cooled solid state laser. 4,429,394, Cl. 372-34.000.
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Hall, James E., to Firestone Tire & Rubber Company, The. Oligomeric oxolanyl alkanes as modifiers for polymerization of dienes using lithium-based initiators. 4,429,091, Cl. 526-181.000.
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Harper, James R.; and O'Klatner, Charles L., to Harper Corporation of America. Adjustable drive system for matching surface speeds of a

transfer roll and plate roll and method thereof. 4,428,288, Cl. 101-248.000.
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Hazelrigg, Mark J., Jr.: *See*—
Caldwell, Donald L.; and Hazelrigg, Mark J., Jr., 4,428,805, Cl. 204-129.000.
Head, Glenn D., Jr.; Le Master, William C.; Bredesky, Louis P., Jr.; and Winter, David C., to Deere & Company. Flow drilling process and tool therefor. 4,428,214, Cl. 72-69.000.
Health Science Products, Inc.: *See*—
Cope, Raymond; and King, Michael, 4,428,631, Cl. 312-194.000.
Hebert, Christian: *See*—
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Heck, James V., to Merck & Co., Inc. 3-Amino-6-substituted thio-1-azabicyclo(3.2.0)hept-6-en-2-one-7-carboxylic acids. 4,428,960, Cl. 424-274.000.
Heck, Wolfgang, to Gambro Dialysatoren KG. Flow-through chamber. 4,428,743, Cl. 604-4.000.
Hedren, Thomas; Eriksson, Albert; Antonasson, Sylve; and Larsson, Rolf, to ESAB Aktiebolag. Chain making apparatus. 4,428,186, Cl. 59-16.000.
Hedrich, Loren W.; and Neighbors, Ralph P., to Gulf Oil Corporation. Control of unwanted vegetation with N-carbamylindolines. 4,428,881, Cl. 548-491.000.
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Junghans, Rudi; and Beisel, Hermann, 4,428,290, Cl. 101-348.000.
Heider, Ulrich, to Siemens Aktiengesellschaft. Impact printing device with an improved print hammer. 4,429,342, Cl. 361-152.000.
Heijenga, Berend; Hilbrink, Hubertus E.; and Klaij, Henri F., to Nederlandse Centrale Organizatie voor Toegepast Natuurwetenschappelijk Onderzoek. Detector for detecting air components. 4,428,907, Cl. 422-61.000.
Heimbach, Klaus J.; Munz, Wolf-Dieter; Adam, Rolf; and Wenzl, Heinz, to Leybold Heraeus GmbH. Method and apparatus for forming electrically conductive transparent oxide. 4,428,809, Cl. 204-192.00P.
Heliotronic Forschungs-Und Entwicklungsgesellschaft Fur Solarzellen-Grundstoffe mbH: *See*—
Gessert, Cord, 4,428,783, Cl. 148-172.000.
Hellberg, Karl-Heinz: *See*—
Willenberg, Heinrich; Hellberg, Karl-Heinz; and Zschiesche, Heinz, 4,428,920, Cl. 423-465.000.
Hempe Manufacturing Co.: *See*—
Keddie, Burton G., 4,428,266, Cl. 83-767.000.
Henderson, James N.; Donbar, Ken W.; Barbour, John J.; and Bell, Anthony J., to Goodyear Tire & Rubber Company, The. Microencapsulated aqueous polymerization catalyst. 4,429,085, Cl. 526-92.000.
Henderson, John G. N.: *See*—
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., 4,429,415, Cl. 455-164.000.
Henk, Keith L., to Pako Corporation. Gear torque sensor apparatus. 4,428,249, Cl. 74-412.0TA.
Henning, Dean L.; Clark, Lewis M., III; and Ward, John M., to Shell Oil Company. Sock skimmer deployment. 4,428,319, Cl. 114-253.000.
Henry Filters, Inc.: *See*—
Creps, John L.; Hainen, Timothy J.; and McEwen, Stephen N., 4,428,838, Cl. 210-323.200.
Henze, Walter J.; and Purcell, William, to Penn Fishing Tackle Mfg. Co. Trolling apparatus. 4,428,139, Cl. 43-20.000.
Hepfner, Anton; and Malicki, Dorothy A., to Hepfner, Anton. Precious metals recovery unit. 4,428,830, Cl. 209-211.000.
Hepp, Dennis G., to Medtronic, Inc. Monitoring device. 4,428,381, Cl. 128-715.000.
Hepp, James. Dual side wall locking attachment for trays to vertical legs in sectional display rack. 4,428,487, Cl. 211-126.000.
Herchenbach, Horst: *See*—
Deussner, Herbert; Herchenbach, Horst; Ramesohl, Hubert; and Breidenstein, Wolfgang, 4,428,727, Cl. 431-182.000.
Hermann, Robert. Locking device. 4,428,211, Cl. 70-34.000.
Herring, James M., Jr., to Budd Company, The. Emergency spring system for a railway car. 4,428,302, Cl. 105-197.00R.
Hessler, Norman F.; Stolfa, Frank; and Munro, William H., to UOP Inc. Integrated thermal cracking and visbreaking process. 4,428,823, Cl. 208-78.000.
Heyligenstaedt & Co. Werkzergmaschinenfabrik GmbH: *See*—
Seeger, Friedrich, 4,428,109, Cl. 29-568.000.
Hi-Lo Manufacturing, Inc.: *See*—
Harrell, Robert L., 4,428,890, Cl. 261-29.000.
Hibari, Eikoh, to Laurel Bank Machine Co., Ltd. Device for preventing faulty counting operations in a paper sheet counter. 4,429,408, Cl. 377-8.000.
Hickmann, Eckhard; and Oeser, Heinz-Guenter, to BASF Aktiengesellschaft. Pyrid-2'-yl-2-trifluoromethyl quinol-4-ylmethanes. 4,429,130, Cl. 546-167.000.
Hickner, Richard A.: *See*—
Lee, George A.; and Hickner, Richard A., 4,428,807, Cl. 204-159.140.
Hideo, Okoshi: *See*—
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Hieronymi, Robert G.: *See*—
Class, Walter H.; Hieronymi, Robert G.; and Hurwitt, Steven D., 4,428,816, Cl. 204-298.000.
Higaki, Yuzo; and Yamada, Osamu, to Nisshin Oil Mills, Ltd., The. Esterification reaction products. 4,428,885, Cl. 260-410.90N.
Higashi, Mitsuo; Morita, Jyun-ichi; Koyama, Kenzi; and Yoshida, Mitsuo, to Nippon Steel Corporation. Chromium-plated steel strip having excellent weldability and resistance to corrosion. 4,429,021, Cl. 428-629.000.
Higginbotham, James M., Sr.: *See*—
Bhatti, Mohinder S.; and Higginbotham, James M., Sr., 4,428,524, Cl. 228-170.000.
Higgins, Robert J., Jr.; and Turner, Harvey N., Jr., to Motorola, Inc. Hybrid filter. 4,429,289, Cl. 333-204.000.
Hilbrink, Hubertus E.: *See*—
Heijenga, Berend; Hilbrink, Hubertus E.; and Klaij, Henri F., 4,428,907, Cl. 422-61.000.
Hildebrandt, Johannes: *See*—
Berner, Heinz; Turnowsky, Friederike; Laber, Georg; and Hildebrandt, Johannes, 4,428,953, Cl. 424-263.000.
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., to Dynetics Engineering Corp. Verifying insertion system and apparatus. 4,429,217, Cl. 235-380.000.

Hillis, Frank M., to Bendix Corporation, The. Electrical connector. 4,428,639, Cl. 339-143.00R.
Hinden, Milton, to Duro Dyne Corporation. Resistance welding pin. 4,429,209, Cl. 219-98.000.
Hinesburg Sand and Gravel Company: *See*—
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Hiniker Company: *See*—
Steinberg, Richard W., 4,428,437, Cl. 172-547.000.
Hinlein, Sigmund: *See*—
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Hirai, Tadaaki: *See*—
Takasaki, Yukio; Hirai, Tadaaki; Yamamoto, Hideaki; Tsukada, Toshihisa; and Mori, Yoshiaki, 4,429,325, Cl. 357-31.000.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Friction clutch control device. 4,428,467, Cl. 192-3.310.
Hirano, Shigeo; and Takagi, Yoshihiro, to Fuji Photo Film Co., Ltd. Method of forming a photographic image. 4,429,036, Cl. 430-405.000.
Hiratsuka, Nobuo: *See*—
Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, 4,429,050, Cl. 436-538.000.
Hiratsuka, Tsugihiko: *See*—
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Hirota, Kazumi; Tsutsumi, Yotaro; Itoh, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; Hori, Ichiro; and Hayashi, Toshihiko, to Toyo Seikan Kaisha, Ltd. Easily-openable heat seal lid. 4,428,494, Cl. 220-270.000.
Hirschberger, August: *See*—
Vogel, Wolfgang; Lutz, Alfons; Igel, Richard; and Hirschberger, August, 4,428,614, Cl. 296-224.000.
Hisamoto, Iwao; Maeda, Chiaki; and Omure, Yukio, to Daikin Kogyo Co., Ltd. Volatile oil compositions for metal working. 4,428,851, Cl. 252-58.000.
Hitachi Chemical Company, Ltd.: *See*—
Yokono, Haruki; and Hiratsuka, Tsugihiko, 4,428,995, Cl. 428-193.000.
Hitachi Koki Company: *See*—
Kobayashi, Kiyoaki; and Kumasaka, Taiichi, 4,428,120, Cl. 30-390.000.
Hitachi, Ltd.: *See*—
Hayashibara, Toshio; Noto, Kunihiro; and Fukasaku, Yoshinori, 4,428,719, Cl. 417-354.000.
Honkawa, Tadashi; Takahata, Fujiya; Yagai, Koichi; Maeda, Yoshio; and Shinden, Tetuya, 4,429,230, Cl. 250-461.200.
Hoshi, Yoshikazu, 4,428,346, Cl. 123-450.000.
Ichiryu, Ken; Watanabe, Haruo; Nakamura, Ichiro; and Akasaka, Yoshimichi, 4,428,559, Cl. 251-129.000.
Sugiyama, Sakae, 4,428,235, Cl. 73-579.000.
Takasaki, Yukio; Hirai, Tadaaki; Yamamoto, Hideaki; Tsukada, Toshihisa; and Mori, Yoshiaki, 4,429,325, Cl. 357-31.000.
Tanimura, Nobuyoshi, 4,429,374, Cl. 365-230.000.
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.
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Gotoh, Shinichi, 4,428,548, Cl. 242-199.000.
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Street, Sidney W., 4,428,992, Cl. 428-114.000.
Hobbs, Simon H.; Rogers, Edward S.; and Antos, George J., to UOP Inc. FCC Sulfur oxide acceptor. 4,428,827, Cl. 208-120.000.
Hoechst Aktiengesellschaft: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; Schon, Franz; and Feess, Erich, 4,428,750, Cl. 8-461.000.
Kleber, Rolf; and Plabst, Dieter, 4,428,846, Cl. 252-8.800.
Papenfuhs, Theodor, 4,429,134, Cl. 548-165.000.
Hoerauf, Werner: *See*—
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Hoff, Stephen J., 4,428,184, Cl. 56-295.000.
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Hoffman, Charles R.: *See*—
Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., 4,429,237, Cl. 307-450.000.
Hoffman, Louis S.: *See*—
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Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., to International Business Machines Corporation. Process and apparatus for interrupting and restarting sequential list-processing operations. 4,429,360, Cl. 364-200.000.
Hoffman, Werner, to BASF Aktiengesellschaft. Preparation of rose oxide predominantly containing the Z isomer. 4,429,144, Cl. 549-356.000.
Hoffmann, Christian: *See*—
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Hoffmann, Gerhard; Graser, Fritz; and Leyrer, Reinhold J., to BASF Aktiengesellschaft. Organic electrophotographic recording medium. 4,429,029, Cl. 430-57.000.
Hoffmann-La Roche Inc.: *See*—
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,428,963, Cl. 424-275.000.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,428,878, Cl. 260-245.700.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,428,879, Cl. 260-245.700.
Hohn, Bernd-Robert, to Audi NSU Auto Union AG. Planetary transmission. 4,428,254, Cl. 74-765.000.
Hohyu Rubber Co., Ltd.: *See*—
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Holden-Parker, Gary. Spray apparatus. 4,428,532, Cl. 239-204.000.
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Martin, Samuel A.; and Bakker, Fredrick J., 4,428,595, Cl. 280-435.000.
Holloway, Richard D. Drinking vessel with integral straw. 4,428,490, Cl. 215-1.00A.
Holm, Per I.; Nyberg, Karl F. L.; and Sodermark, Ulf A., to Telefonaktiebolaget L M Ericsson. Mitigation of faults in a telephone exchange. 4,429,184, Cl. 179-18.0EE.
Holmes, Clyde A.; and Vance, Macy W., to United States Steel Corporation. Insulation for a furnace member. 4,428,730, Cl. 432-3.000.
Holstrom, John R., to AMSTED Industries Incorporated. Flowmeter using twisting torque. 4,428,242, Cl. 73-861.750.
Holzer, Peter, to Scintilla AG. Percussive drill with safety interlock for reversing gear. 4,428,438, Cl. 173-48.000.
Holzhausen, Alan D.: *See*—
Stenstrom, Craig A.; Holzhausen, Alan D.; and Stepp, Thomas R., Jr., 4,428,450, Cl. 180-148.000.
Hom, Foo S.: *See*—
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Homestake Mining Company: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ida, Jinsei; Hagimoto, Yoshio; and Fujita, Tsutomu, 4,428,256, Cl. 74-820.000.
Yamagata, Tetsuo; Sato, Morio; Ogishima, Tetsuo; and Matsuyama, Yoji, 4,428,227, Cl. 73-115.000.
Honeywell Inc.: *See*—
Bentsen, Louis J., 4,428,529, Cl. 236-49.000.
Chynoweth, William R., 4,429,179, Cl. 174-117.00M.
Gelinas, Raymond C., 4,429,280, Cl. 329-200.000.
Gelinas, Raymond C., 4,429,288, Cl. 332-51.00R.
Honeywell Information Systems Inc.: *See*—
Maccianti, Tiziano; and Zanchi, Vittorio, 4,429,361, Cl. 364-200.000.
Honkawa, Tadashi; Takahata, Fujiya; Yagai, Koichi; Maeda, Yoshio; and Shindes, Tetuya, to Hitachi, Ltd. Fluorescence polarization analyzer. 4,429,230, Cl. 250-461.200.
Hooper, John H., to Vac-Aero International Inc. Heating element insulating and support system. 4,429,403, Cl. 373-128.000.
Hooper, Robert L., to Microdyne Corporation. Frequency agile satellite receiver. 4,429,418, Cl. 455-314.000.
Hopkins, Quentin G., to FMC Corporation. Process for manufacturing hydrogen peroxide. 4,428,922, Cl. 423-588.000.
Horbelt, Michael: *See*—
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.
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Horii, Sadashige; Imai, Hirozoh; and Hamashima, Tetsuo, to Matsushita Electric Works, Ltd. Reciprocating type electric shaver. 4,428,117, Cl. 30-43.910.
Horn, Friedrich. Therapeutical air mattress. 4,428,087, Cl. 5-449.000.
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, to Saat- und Erntetechnik GmbH. Method for the homogeneous complete encapsulation of individual grains of pourable material and apparatus for its production. 4,428,973, Cl. 427-3.000.
Horton, Paul L.; and Hideo, Okoshi, to Excelermatic Inc.; and Nippon Seiko Kabushiki Kaisha. Infinitely variable traction roller transmission. 4,428,246, Cl. 74-200.000.
Hosaka, Akio: *See*—
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Hoshi, Yoshikazu, to Hitachi, Ltd. Control apparatus for electrically controlled injection pump of diesel engine. 4,428,346, Cl. 123-450.000.
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Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,428,652, Cl. 354-407.000.

Hosokawa, Minoru; Oguchi, Koichi; and Yazawa, Satoru, to Kabushiki, Kaisha Suwa Seikosha. Liquid crystal display system. 4,429,305, Cl. 340-784.000.
Hosomi, Fumio: *See*—
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House, Gary E.: *See*—
House, Sherre D.; and House, Gary E., 4,428,842, Cl. 210-747.000.
House, Sherre D.; and House, Gary E. Well reserve pit liquor treatment process. 4,428,842, Cl. 210-747.000.
Howard, Lawrence E., to Napp Systems (USA), Inc. Apparatus and method for removing soluble portions of a coating. 4,428,659, Cl. 354-317.000.
Howard, Richard E.; Pleibel, William; and Stolen, Roger H., to Bell Telephone Laboratories, Incorporated. Lithographic method of making optical fibers. 4,428,761, Cl. 65-3.120.
Howarth, Thomas T., to Beecham Group Limited. Antibacterial agents. 4,428,937, Cl. 424-114.000.
Howell, Edward K., to General Electric Co. Bargraph displays for static trip circuit breakers. 4,429,340, Cl. 361-96.000.
Howell, Gary W., to Du Pont de Nemours, E. I., and Company. Fluid handling apparatus having a fluid metering volume therein. 4,428,511, Cl. 222-309.000.
Hoxan Corporation: *See*—
Kuraoka, Yasuo, 4,428,684, Cl. 374-25.000.
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., to Societe D'Assistance Technique Pour Produits Nestle S.A. Preparation of sauerkraut utilizing hydrolyzed protein. 4,428,968, Cl. 426-49.000.
Huang, I-Der: *See*—
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Hubbard, Kevin L.; and Roth, Robert R., to Deere & Company. Agricultural implement with hitch control. 4,428,435, Cl. 172-328.000.
Hubbell, Wayne L.: *See*—
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Hubdean Limited: *See*—
Rawlins, Patrick R., 4,428,994, Cl. 428-164.000.
Hubel, Werner: *See*—
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Hubele, Adolf; Riebli, Peter; Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Sulfinyl- and sulfonylacetanilides and their use as microbicides. 4,428,964, Cl. 424-309.000.
Huber, John W.: *See*—
Zang, Daniel M.; and Huber, John W., 4,428,331, Cl. 123-52.0MV.
Huber, Ulrich; and Wild, Hans-Jakob, to Givaudan Corporation. Novel intermediates for the preparation of α-hydroxycarbonyl compounds. 4,428,886, Cl. 260-464.000.
Huchzermeier, Hans M., to Bremer Vulkan Schiffbau and Maschinenfabrick. Ventilation arrangement for a cargo ship. 4,428,318, Cl. 114-211.000.
Hughes Aircraft Company: *See*—
Giuliano, Concetto R., 4,429,393, Cl. 372-21.000.
Pastor, Ricardo C.; Gorre, Luisa E.; Pastor, Antonio C.; and Chew, Remedios K., 4,429,009, Cl. 428-410.000.
Robertson, Ralston S., Jr.; and Eisenhart, Robert L., 4,429,287, Cl. 331-107.0DP.
Wong, Shi-Yin; Little, Michael J.; Margerum, J. David; Nussmeier, Thomas A.; Calderone, Theodore; and Dellamano, Harry A., 4,428,380, Cl. 128-715.000.
Hughes, Raymond B.: *See*—
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Watkins, Bruce J., 4,428,433, Cl. 166-339.000.
Zahradnik, Anton F., 4,428,687, Cl. 384-94.000.
Hulsing, Rand H., II; and Morrow, John A., to Sundstrand Data Control, Inc. Instrument mounting. 4,428,123, Cl. 33-313.000.
Hume, Kenneth M. Plate bending method. 4,428,215, Cl. 72-133.000.
Humphrey Products Company: *See*—
Loveless, Stanley M., 4,428,276, Cl. 92-249.000.
Huperz, Adalbert; and Maasberg, Wolfgang, to Woma-Apparatebau W. Maasberg & Co. GmbH. Device for connecting a plunger at its crank end to a connecting rod. 4,428,275, Cl. 92-188.000.
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Goetz, Norbert; Jacobs, Peter; Hupfer, Leopold; Toussaint, Herbert; and Reiss, Wolfgang, 4,429,155, Cl. 564-402.000.
Hurley, Thomas J.: *See*—
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Class, Walter H.; Hieronymi, Robert G.; and Hurwitt, Steven D., 4,428,816, Cl. 204-298.000.
Hussain, Anwar A., to University of Kentucky Research Foundation, The. Novel method of administering β-blockers and novel dosage forms containing same. 4,428,883, Cl. 424-248.510.
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Hutson, Thomas, Jr.; and Hann, Paul D., to Phillips Petroleum Company. Production of high-octane, unleaded motor fuel by alkylation of isobutane with isoamylenes obtained by dehydrogenation of isopentane. 4,429,173, Cl. 585-331.000.
Hyatt, Gilbert P.: *See*—
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Hynson, Charles G. Chair for immobile patients. 4,428,615, Cl. 297-118.000.
I. D. Engineering, Inc.: *See*—
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Ibaragi, Hideo: *See*—
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Ichiryu, Ken; Watanabe, Haruo; Nakamura, Ichiro; and Akasaka, Yoshimichi, to Hitachi, Ltd. Direct drive type servo valve. 4,428,559, Cl. 251-129.000.
Ida, Jinsei; Hagimoto, Yoshio; and Fujita, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Geneva gear apparatus for driving an index table. 4,428,256, Cl. 74-820.000.
Ide, Yoshiaki, to Celanese Corporation. Lightweight high performance foams of thermotropic liquid crystal polymers comprising recurring 6-oxy-2-naphthoyl moieties. 4,429,060, Cl. 521-182.000.
Ide, Yoshiaki, to Celanese Corporation. Heat treated high performance foams of thermotropic liquid crystal polymers. 4,429,061, Cl. 521-182.000.
Idemitsu Kosan Company Limited: *See*—
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Igarashi, Taizo: *See*—
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Igarashi, Toshio: *See*—
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Igel, Richard: *See*—
Vogel, Wolfgang; Lutz, Alfons; Igel, Richard; and Hirschberger, August, 4,428,614, Cl. 296-224.000.
Iglesias, Ney M. Activating device for a pressurized can. 4,428,510, Cl. 222-180.000.
Ikeda, Hidenori, to Nippon Electric Co., Ltd. Speech synthesizer apparatus. 4,429,367, Cl. 364-513.000.
Ikeda, Shoji: *See*—
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Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,429,024, Cl. 428-694.000.
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Cogswell, Frederic N.; and Swerdlow, Martin S., 4,429,078, Cl. 525-165.000.
Feasey, Ronald G., 4,429,104, Cl. 528-206.000.
Punja, Nazim, 4,429,153, Cl. 562-493.000.
Stanier, Colin, 4,428,813, Cl. 204-253.000.
Whittaker, Graham, 4,429,132, Cl. 546-346.000.
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Inbar, Dan, to Elscint, Inc. Method of and means for improving the resolution of a gamma camera. 4,429,226, Cl. 250-363.00S.
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Muhler, Joseph C.; and Putt, Mark S., 4,428,928, Cl. 424-49.000.
Industrial Electronic Hardware: *See*—
Pittman, Robert B., 4,428,640, Cl. 339-176.00M.
Industrial Tools Inc.: *See*—
Bolton, James C., 4,428,265, Cl. 83-502.000.
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Bovio, Michele; Sella, Lino; Berruti, Pierangelo; Gillone, Walter; and Ceresa, Luciano, 4,428,693, Cl. 400-126.000.
Ingenious Devices Limited: *See*—
Willemsen, Bernardus A.; and Parnham, Ray G., 4,428,160, Cl. 51-129.000.
Ingoglia, Joseph E. Self-contained guitar amplification system. 4,428,268, Cl. 84-1.160.
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Institut Francais du Petrole: *See*—
Laurent, Jean, 4,428,422, Cl. 166-212.000.
Ramet, Claude; and Rojey, Alexandre, 4,428,853, Cl. 252-67.000.
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Galibert, Francis; Tiollais, Pierre; and Charnay, Patrick, 4,428,941, Cl. 424-177.000.

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Bessis, Marcel, 4,428,669, Cl. 356-39.000.
Institut Pasteur: *See*—
Galibert, Francis; Tiollais, Pierre; and Charnay, Patrick, 4,428,941, Cl. 424-177.000.
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Aboelfotoh, Mohamed O., 4,429,303, Cl. 340-701.000.
Berry, Richard E.; and Wilson, John H., 4,429,372, Cl. 364-900.000.
Bux, Werner; and Mueller, Hans R., 4,429,405, Cl. 375-89.000.
Cannon, Jack W., 4,428,692, Cl. 400-124.000.
Chastang, Jean C. A.; and Koerner, Robert F., 4,428,676, Cl. 356-354.000.
Cole, Norman F.; and Thorne, William D., 4,428,285, Cl. 101-93.040.
Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., 4,429,237, Cl. 307-450.000.
Duke, Alan H.; Hartung, Michael H.; and Marschner, Frederick J., 4,429,363, Cl. 364-200.000.
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,429,360, Cl. 364-200.000.
Macauley, George C.; Nemecek, William F.; and Roefer, Robert W., 4,429,306, Cl. 340-790.000.
Thorne, William D., 4,428,284, Cl. 101-93.040.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,429,151, Cl. 560-261.000.
Hall, John B.; and Sprecker, Mark A., 4,428,966, Cl. 426-3.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,428,387, Cl. 131-276.000.
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,428,869, Cl. 252-522.00A.
International Paper Company: *See*—
Brauner, Arne H., 4,428,525, Cl. 229-41.00R.
International Precision Incorporated: *See*—
Yonezawa, Akira, 4,429,222, Cl. 250-311.000.
International Standard Electric Corporation: *See*—
Lighty, Paul E., 4,428,646, Cl. 350-96.310.
Nemecsek, Ferenc; and Wilke, Elmar, 4,429,183, Cl. 179-6.30R.
International Telephone and Telegraph Corporation: *See*—
Dean, John R., 4,429,348, Cl. 361-399.000.
Oh, Shin M., 4,428,760, Cl. 65-2.000.
Interox: *See*—
Brichard, Jean; and Colery, Jean-Claude, 4,428,914, Cl. 423-265.000.
Inui, Kenichi; Kobayashi, Hisao; and Funabashi, Tadao, to Toshiba Electric Equipment Corporation. Transistor inverter device. 4,429,356, Cl. 363-56.000.
Ippolito, Anthony C., to Wurlitzer Company, The. Electronic vibrato or celeste. 4,428,270, Cl. 84-1.240.
IRECO Chemicals: *See*—
Jessop, Harvey A.; and Funk, Albert G., 4,428,784, Cl. 149-2.000.
Irie, Yutaka: *See*—
Ito, Hideo; Irie, Yutaka; and Nakamura, Minoru, 4,428,663, Cl. 355-14.00R.
Irikura, Tsutomu; Koga, Hiroshi; and Ito, Akira, to Kyorin Pharmaceutical Co., Ltd. Quinoline carboxylic acid derivative. 4,429,127, Cl. 544-363.000.
Isao, Akihiko: *See*—
Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, 4,428,979, Cl. 427-162.000.
Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, 4,428,980, Cl. 427-162.000.
Isenberg, Arnold O., to Westinghouse Electric Corp. Sensor cell structure for oxygen-combustibles gas mixture sensor. 4,428,817, Cl. 204-412.000.
Isenberg, Arnold O.: *See*—
Phillips, D. Colin; Emmerich, Werner S.; Isenberg, Arnold O.; and Down, Michael G., 4,428,905, Cl. 376-323.000.
Ishibashi, Kengi: *See*—
Kubo, Seiji; and Ishibashi, Kengi, 4,428,402, Cl. 138-118.100.
Ishida, Takashi; and Tominari, Noboru, to Mikuni Kogyo Kabushiki Kaisha. Throttle valve driving mechanism. 4,428,891, Cl. 261-65.000.
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Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, 4,428,446, Cl. 180-54.00A.
Ishii, Yasuhiro: *See*—
Miyoshi, Yasushi; and Ishii, Yasuhiro, 4,428,996, Cl. 428-198.000.
Isner, William G.; and Smoyer, John C., to Scott Paper Company. Laminated wiper. 4,429,014, Cl. 428-152.000.
Isover Saint-Gobain: *See*—
Buck, Yves; and Delcoigne, Adrien, 4,428,898, Cl. 264-167.000.
Itek Corporation: *See*—
Barewald, James R., 4,429,311, Cl. 343-18.00E.
Ito, Akihiko; Kobayashi, Kazuhiro; Tanaka, Hisami; and Ueno, Norio, to Fujitsu Limited. Integrator for a switched capacitor-filter. 4,429,281, Cl. 330-9.000.
Ito, Akira: *See*—
Irikura, Tsutomu; Koga, Hiroshi; and Ito, Akira, 4,429,127, Cl. 544-363.000.
Ito, Hideo; Irie, Yutaka; and Nakamura, Minoru, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying machine. 4,428,663, Cl. 355-14.00R.
Itoh, Senji: *See*—
Hirota, Kazumi; Tsutsumi, Yotaro; Itoh, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; Hori, Ichiro; and Hayashi, Toshihiko, 4,428,494, Cl. 220-270.000.
Itoh, Shojiro; Murashige, Masayuki; and Igarashi, Toshio, to Sumitomo Chemical Company, Limited. Vinyl chloride plastisol compositions. 4,429,071, Cl. 524-569.000.
Itoh, Yokichi: *See*—
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.
ITT Industries Inc.: *See*—
Burgdorf, Jochen; Luepertz, Hans-Henning; and Stoka, Roberto, 4,428,463, Cl. 188-73.380.
Drake, Cyril F.; Maries, Alan; and Bateson, Paul F., 4,428,774, Cl. 106-14.390.
Iwai, Tohru: *See*—
Yoshida, Kenichi; Ono, Kimizo; Sunago, Katsuyoshi; Takenaka, Shinya; and Iwai, Tohru, 4,429,392, Cl. 372-9.000.
Iwami, Isamu: *See*—
Sakurai, Tokio; Komiya, Kyosuke; Mori, Yoshihiko; Kitahama, Yoshiharu; and Iwami, Isamu, 4,429,171, Cl. 568-804.000.
Iwamura, Junichi, to Tokiwa Kanpo Pharmaceutical Co., Ltd. Process for isolating saponins and flavonoids from leguminous plants. 4,428,876, Cl. 260-123.500.
Iwamura, Junichi: *See*—
Nakamura, Hajime; Iwamura, Junichi; Nakajima, Yoshio; and Hasegawa, Masaji, 4,428,245, Cl. 73-864.520.
Iyoda, Tetsuo: *See*—
Tamai, Masayoshi; and Iyoda, Tetsuo, 4,429,315, Cl. 346-75.000.
J. M. Voith GmbH: *See*—
Kuhn, Friedrich, 4,428,543, Cl. 242-66.000.
Valdivia, Juan, 4,428,538, Cl. 241-298.000.
J. T. Baker Chemical Company: *See*—
Ward, Irl E.; Hallquist, Lisa G.; and Hurley, Thomas J., 4,428,871, Cl. 252-542.000.
Jabs, Gert; Baatz, Gunther; Bock, Manfred; Dahm, Manfred; Haus, Artur; and Wegner, Christian, to Bayer Aktiengesellschaft. Concentrated microcapsule suspensions for reaction copying papers. 4,428,978, Cl. 427-150.000.
Jackson, Keith L., to Lukens General Industries, Inc. Radial axle railway truck. 4,428,301, Cl. 105-168.000.
Jacobs, Peter: *See*—
Goetz, Norbert; Jacobs, Peter; Hupfer, Leopold; Toussaint, Herbert; and Reiss, Wolfgang, 4,429,155, Cl. 564-402.000.
Jaeschke, James R.; and Rutchik, Walter L., to Eaton Corporation. AC Transistor switch with overcurrent protection. 4,429,339, Cl. 361-93.000.
Jahnle, Herbert A., to Budd Company, The. Front and rear energy absorbing structures for a four passenger vehicle. 4,428,599, Cl. 280-784.000.
Jamieson, John W., to Qume Corporation. Cartridge with self adjusting pressure roller and end of ribbon detection means. 4,428,695, Cl. 400-249.000.
Janome Sewing Machine Co. Ltd.: *See*—
Sano, Yasuro, 4,428,311, Cl. 112-158.00A.
Janssen, Thomas B. Toothbrush. 4,428,091, Cl. 15-167.00A.
Jastrzebski, Lubomir L.; and Lagowski, Jacek, to RCA Corporation. Method for determining oxygen content in semiconductor material. 4,429,047, Cl. 436-4.000.
Jenn-Air Corporation: *See*—
Field, Thomas R., 4,428,357, Cl. 126-299.00R.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Avicola, Kenneth, 4,429,401, Cl. 373-12.000.
Jessop, Harvey A.; and Funk, Albert G., to IRECO Chemicals. Blasting compositions containing sodium nitrate. 4,428,784, Cl. 149-2.000.
Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; Tobisawa, Yoshio; and Fujii, Tadaaki, 4,428,399, Cl. 137-625.220.
Johansson, Bengt: *See*—
Gruzling, Joe; Johansson, Bengt; Keinonen, Arno; Revill, Colin; and Laskow, Vlodek, 4,428,735, Cl. 440-76.000.
John Wyeth and Brother Limited: *See*—
Cavalla, John F.; and Wyllie, Michael G., 4,428,954, Cl. 424-263.000.
Johnson, James H. Cartridge magazine. 4,428,137, Cl. 42-50.000.
Johnson & Johnson Baby Products Company: *See*—
Cristofolo, Angelo R., 4,428,477, Cl. 206-210.000.
Johnson, Lars: *See*—
Persson, Goran; and Johnson, Lars, 4,428,680, Cl. 366-296.000.
Johnson Matthey & Co., Limited: *See*—
Day, Joseph G., 4,428,768, Cl. 75-10.00R.
Johnson, Robert M.; and Melling, Elmer M., to National Gypsum Company. Reinforced cement sheet product containing no asbestos for fabricating on hatschek machine. 4,428,775, Cl. 106-90.000.
Johnson, Russell D. Seed trench digger with indexing structure. 4,428,436, Cl. 172-372.000.
Johnston, James S., to Rosemount Engineering Company Limited. Differential pressure measuring apparatus. 4,428,239, Cl. 73-705.000.
Jones, Edwin R., Jr.; Cathey, LeConte; and McLaurin, A. Porter, to CJM Associates. Three-dimensional display methods using vertically aligned points of origin. 4,429,328, Cl. 358-88.000.

Jones, Henry B., to Texaco Inc. Fluid catalytic cracking. 4,428,822, Cl. 208-76.000.

Jones, Leon; and Wilcox, Orland W., to Protection, Inc. Breathing valve. 4,428,392, Cl. 137-102.000.

Jones, Paul, Jr., to Kayser-Roth Corporation. Molded shoe sole construction. 4,428,129, Cl. 36-245.000.

Jordan, C. Wane; and Walker, John W., to Banquet Foods Corporation. Chicken weighing apparatus. 4,428,179, Cl. 53-502.000.

Jorgensen, Neal A.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Jorgensen, Neal A., 4,428,946, Cl. 424-236.000.

Jorgensen, Robert W., to Harvey Hubbell Incorporated. Gangable housing. 4,428,492, Cl. 220-3.940.

Joun, Chong-Long. Water control device for flush toilet. 4,428,084, Cl. 4-407.000.

Juhola, Mauno O. Procedure and means for providing a vertical drain in the bottom of a water body. 4,428,699, Cl. 405-50.000.

Julius, Robert P.; Dwan, William E.; and Tullar, Albert F., to Nice-Pak Products, Inc. Dispenser for moist towelettes. 4,428,497, Cl. 220-339.000.

Junghans, Rudi; and Beisel, Hermann, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for axially reciprocating an inking-unit roller of a rotary printing machine. 4,428,290, Cl. 101-348.000.

Jurchenko, Alexandr F.: *See*—
Teplinsky, Anatoly D.; Jurchenko, Alexandr F.; and Yarovinsky, Grigory A., 4,428,414, Cl. 164-158.000.

Jury, Anthony W.; and Pitt, Geoffrey J., to Coal Industry (Patents) Limited. Apparatus and method for assessing the concentration of mineral matter in coal-derived liquids. 4,429,410, Cl. 378-53.000.

Kabat, Jules M.; and Beggs, James H., to Robertshaw Controls Company. Two-way AC power line communications system. 4,429,299, Cl. 340-310.00R.

Kabushiki Kaisha Gemvac: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,429,197, Cl. 200-144.00B.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Shimizu, Yoshiaki, 4,428,330, Cl. 123-41.350.
Taki, Hiroyuki; Mizuguchi, Hidenori; and Ota, Hiroshi, 4,428,621, Cl. 303-13.000.

Kabushiki Kaisha Meidensha: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,429,197, Cl. 200-144.00B.

Kabushiki, Kaisha Suwa Seikosha: *See*—
Hosokawa, Minoru; Oguchi, Koichi; and Yazawa, Satoru, 4,429,305, Cl. 340-784.000.
Kanai, Masao; and Koshiro, Hirotomo, 4,428,802, Cl. 204-43.00N.

Kabushiki Kaisha Suwa Seikosha & Epson Corporation: *See*—
Yajima, Torao; and Gomi, Yoshifumi, 4,429,268, Cl. 318-696.000.

Kabushiki Kaisha Takemi: *See*—
Yoshida, Takashi, 4,428,147, Cl. 46-1.00R.

Kahle, Horst: *See*—
Stiefel, Christian; Friedrichs, Josef; Marsella, Gino; and Kahle, Horst, 4,428,565, Cl. 267-9.00A.

Kajetanczyk, Franz: *See*—
Zellerhoff, Robert; Zander, Maximilian; and Kajetanczyk, Franz, 4,429,172, Cl. 585-241.000.

Kakeno, Sadao: *See*—
Umezawa, Michio; Naruse, Osamu; Furukawa, Tatsuya; Ohori, Tamio; Furukawa, Isokazu; and Kakeno, Sadao, 4,429,317, Cl. 346-75.000.

Kakizoe, Masahiro: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,429,198, Cl. 200-144.00R.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Keve, Tibor; Dancsi, Lajos; Galambos, Janos; Vezekenyi, Ferenc; and Acs, Tibor, 4,429,129, Cl. 546-70.000.

Kali-Chemie Aktiengesellschaft: *See*—
Willenberg, Heinrich; Hellberg, Karl-Heinz; and Zachiesche, Heinz, 4,428,920, Cl. 423-465.000.

Kalokhe, Shivdas, to Ex-Cell-O Corporation. Micro-adjusting cartridge for cutting tool. 4,428,704, Cl. 408-156.000.

Kaluschke, Thomas: *See*—
Boie, Immo; Peters, Manfred; and Kaluschke, Thomas, 4,429,033, Cl. 430-237.000.

Kam, Lit-Yam; and Olsson, Billy E., to AMP Incorporated. Multi-contact connectors for closely spaced conductors. 4,428,636, Cl. 339-97.00P.

Kamberg, Eduard, to New Super Laundry Machinery Co, Inc. Heat exchanger for flatwork ironer's. 4,428,133, Cl. 38-44.000.

Kaminow, Ivan P.: *See*—
Glass, Alastair M.; Kaminow, Ivan P.; and Olson, Donald H., 4,428,644, Cl. 350-96.140.

Kaminski, Stanley X., to Siemens Corporation. Special character sequence detection circuit arrangement. 4,429,387, Cl. 370-110.100.

Kamioka, Masaru: *See*—
Takatsu, Yukihiro; Yamamoto, Shoichi; and Kamioka, Masaru, 4,428,261, Cl. 81-434.000.

Kammiller, Neil A., to Reliance Electric Company. Synchronizing circuit for use in paralleled high frequency power supplies. 4,429,233, Cl. 307-87.000.

Kamon, Yoshoyuki; and Yokoyama, Yoshihiro, to Sony Corporation. Earphone. 4,429,194, Cl. 179-182.00R.

Kamp, Ewald A., to Union Carbide Corporation. Film-tape-closure device slot cast integrated interlocking structure and extrusion method. 4,428,788, Cl. 156-66.000.

Kampe, Wolfgang: *See*—
Friebe, Walter-Gunar; Kampe, Wolfgang; Roesch, Egon; and Wilhelms, Otto-Henning, 4,428,955, Cl. 424-267.000.

Kamstrup-Larsen, Jorgen, to Superfos Glasuld A/S. Plate-shaped insulation member and a method for manufacturing such a member. 4,428,991, Cl. 428-44.000.

Kanai, Karoly: *See*—
Tomoskozi, Istvan; Szekely, Istvan; Kanai, Karoly; Gyori, Peter; and Kovacs, Gabor, 4,429,123, Cl. 542-426.000.

Kanai, Masao; and Koshiro, Hirotomo, to Kabushiki Kaisha Suwa Seikosha; and Nisshin Kasei Kabushiki Kaisha. Palladium-nickel alloy electroplating and solutions therefor. 4,428,802, Cl. 204-43.00N.

Kanai, Ryokichi, to Clarion Co., Ltd. Video cipher processing system. 4,429,331, Cl. 358-124.000.

Kanai, Takao: *See*—
Chaki, Takao; Watanabe, Nobuaki; and Kanai, Takao, 4,428,322, Cl. 116-261.000.

Kanebo Ltd.: *See*—
Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, 4,428,806, Cl. 204-158.0HA.

Kaneko, Hideki: *See*—
Kimpara, Nobuyuki; Kaneko, Hideki; and Moriya, Yoshifumi, 4,428,726, Cl. 431-78.000.

Kaneko, Kenji: *See*—
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.

Kaneko, Takashi; and Shidara, Tokihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas laser tube. 4,429,399, Cl. 372-65.000.

Kanngiesser, Karl-Werner: *See*—
Hausler, Michael; and Kanngiesser, Karl-Werner, 4,429,357, Cl. 363-68.000.

Kao Soap Co., Ltd.: *See*—
Yasuda, Yutaka; Tsuchihashi, Kiyoshi; and Nishimura, Toshiro, 4,428,884, Cl. 260-404.500.

Kapicak, Louis A.: *See*—
Abatjoglou, Anthony G.; and Kapicak, Louis A., 4,429,161, Cl. 568-14.000.

Kaplinsky, Cecil H., to U.S. Philips Corporation. Communication system having an information bus and circuits therefor. 4,429,384, Cl. 370-85.000.

Karpati, Egon: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.

Karrer, Friedrich; Berner, Godwin; and Rody, Jean, to Ciba-Geigy Corporation. Process for curing stoving lacquers. 4,429,077, Cl. 525-143.000.

Kashio, Toshio, to Casio Computer Co. Ltd. Date display device. 4,428,681, Cl. 368-21.000.

Kasik, James E.; Qurnell, Frank D.; and Dennison, David K., to General Electric Company. Fuel rod fission gas crimping arrangement and method. 4,428,903, Cl. 376-261.000.

Kaspar, Melvin C., to Ardco, Inc. Hold-open mechanism for refrigerated display cabinet having cooperating spring and lobed plate. 4,428,096, Cl. 16-335.000.

Kasprzyk, Marlon Z.: *See*—
Doubek, Edward R.; and Kasprzyk, Marlon Z., 4,429,271, Cl. 324-60.0CD.

Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,428,598, Cl. 280-644.000.

Kassai, Kenzou, to Kassai Kabushikikaisha. Baby carriage. 4,428,598, Cl. 280-644.000.

Kastura, John L.: *See*—
Luckman, James E.; Kastura, John L.; and Voreis, Thomas L., 4,429,365, Cl. 364-431.080.

Kasugayama, Yukio: *See*—
Hattori, Yoshihumi; Terasawa, Koji; and Kasugayama, Yukio, 4,429,320, Cl. 346-140.00R.

Kataoka, Yoshitaka, to Komori Printing Machinery Co., Ltd. Paper delivery apparatus for use in rotary printing presses. 4,428,574, Cl. 271-307.000.

Katase, Masazumi: *See*—
Yashiki, Tomohiro; Hosomi, Fumio; Wakahata, Yasuo; Nishino, Atsushi; Wasa, Kiyotaka; and Katase, Masazumi, 4,428,909, Cl. 422-95.000.

Kato, Eiichi; Ohki, Nobutaka; and Ogawa, Junkichi, to Fuji Photo Film Co., Ltd. Black and white photographic materials. 4,429,035, Cl. 430-402.000.

Kato, Masayuki: *See*—
Ueda, Ikuo; Kato, Masayuki; and Nagano, Masanobu, 4,429,126, Cl. 544-250.000.

Kato, Shunichi; and Aikawa, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Device for measuring the imbalance of an object. 4,428,225, Cl. 73-65.000.

Katsura, Tadahiko: *See*—
Hirota, Kazumi; Tsutsumi, Yotaro; Itoh, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; Hori, Ichiro; and Hayashi, Toshihiko, 4,428,494, Cl. 220-270.000.

Kawa, Franz: *See*—
Schwenzfeier, Werner; and Kawa, Franz, 4,428,737, Cl. 464-28.000.

Kawabata, Takashi: *See*—
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,428,652, Cl. 354-407.000.
Kawai, Hisasi: *See*—
Odogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,428,558, Cl. 251-65.000.
Kawakami, Kiyoshi: *See*—
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Kawasaki Steel Corporation: *See*—
Yanazawa, Tadaaki; Tanaka, Teruaki; Noda, Akio; and Morita, Takashi, 4,428,217, Cl. 72-250.000.
Kay, David B., to Xerox Corporation. Optical scanning system with wavelength shift correction. 4,428,643, Cl. 350-3.710.
Kaye, Alan S., to United Kingdom Atomic Energy Authority. Lasers. 4,429,400, Cl. 372-95.000.
Kayros, Richard: *See*—
Whittaker, Vernon; and Kayros, Richard, 4,428,444, Cl. 177-187.000.
Kayser-Roth Corporation: *See*—
Jones, Paul, Jr., 4,428,129, Cl. 36-245.000.
Keane, John J.; and Zopf, Richard F., to General Electric Company. Dry film resists. 4,429,034, Cl. 430-271.000.
Keddie, Burton G., to Hempe Manufacturing Co. Miter saw having a swivel handle. 4,428,266, Cl. 83-767.000.
Keely, Patricia G. Insertion unit for a vaginal diaphragm. 4,428,370, Cl. 128-127.000.
Keeton, John H. Automatic sleeve making. 4,428,315, Cl. 112-262.300.
Keinonen, Arno: *See*—
Gruzling, Joe; Johansson, Bengt; Keinonen, Arno; Revill, Colin; and Laskow, Vlodek, 4,428,735, Cl. 440-76.000.
Keith, Alec D., to Key Pharmaceuticals, Inc. Sustained release glycerol trinitrate. 4,428,925, Cl. 424-19.000.
Keith, Alec D., to Key Pharmaceuticals, Inc. Sustained release propranolol system. 4,428,926, Cl. 424-19.000.
Kekish, George T.; and Xieu, Diep V., to Nalco Chemical Company. Phosphated alumina as slag modifier. 4,428,310, Cl. 110-342.000.
Keller, Felix: *See*—
Fischer, Werner K.; Keller, Felix; and Hanni, Max, 4,428,679, Cl. 366-141.000.
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Yochum, Billy G.; and Keller, G. James, 4,429,219, Cl. 250-229.000.
Keller, Willy. Stops for lines. 4,428,143, Cl. 43-44.900.
Kelly, Jonathan S.: *See*—
Eagles, Brian A.; and Kelly, Jonathan S., 4,428,619, Cl. 299-81.000.
Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,428,906, Cl. 419-48.000.
Kemmner, Ulrich, to Robert Bosch GmbH. Device for controlling at least one throttle diameter in a control line. 4,428,356, Cl. 123-585.000.
Kemnade, Jorg: *See*—
Kunkel, Wolfgang; Kemnade, Jorg; and Schneider, Dietrich, 4,428,923, Cl. 423-588.000.
Kempke, William G.: *See*—
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,429,360, Cl. 364-200.000.
Kendall Company, The: *See*—
McAvinn, James D.; and Li, Felipe S., 4,428,488, Cl. 211-181.000.
Kennecott Corporation: *See*—
Marshall, David W., 4,428,989, Cl. 428-35.000.
Kennedy, Joseph P.; and Guhaniyogi, Suhas, to University of Akron, The. Phenol terminated polymers and epoxies therefrom. 4,429,099, Cl. 528-98.000.
Kennedy, Maurice E.: *See*—
Main, Robert T.; and Kennedy, Maurice E., 4,428,649, Cl. 350-289.000.
Kennon, Jerry M., to Westinghouse Electric Corp. Microprocessor-based load management terminal with reset. 4,429,366, Cl. 364-482.000.
Kenny, Andrew A.: *See*—
Anderson, Patrick J.; and Kenny, Andrew A., 4,428,393, Cl. 137-117.000.
Stahly, Daniel C.; and Kenny, Andrew A., 4,428,353, Cl. 123-568.000.
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Iniotakis, Nicolaos, 4,428,756, Cl. 55-158.000.
Kerr, James S. Optical illusion chamber. 4,428,575, Cl. 272-8.00R.
Ketterer, Stanley J., to Singer Company, The. Loop positioning arrangement for double pointed looper sewing machine. 4,428,312, Cl. 112-199.000.
Keve, Tibor: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.
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Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D., 4,428,925, Cl. 424-19.000.
Keith, Alec D., 4,428,926, Cl. 424-19.000.
Kiehs, Karl: *See*—
Seufert, Walter; Kiehs, Karl; Husslein, Gerd; Varwig, Juergen; Hamprecht, Gerhard; and Adolphi, Heinrich, 4,428,944, Cl. 424-217.000.
Kihira, Masafumi: *See*—
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Kim, Jin K., to RCA Corporation. Method of making an array of series connected solar cells on a single substrate. 4,428,110, Cl. 29-572.000.
Kim, Manjin J.; and Chow, Tat-Sing P., to General Electric Company. Composite conductive structures and method of making same. 4,429,011, Cl. 428-450.000.
Kimpara, Hidenori: *See*—
Gaku, Morio; Nagai, Syunichi; Kimpara, Hidenori; and Ayano, Satoshi, 4,429,112, Cl. 528-422.000.
Kimpara, Nobuyuki; Kaneko, Hideki; and Moriya, Yoshifumi, to Matsushita Electric Industrial Co., Ltd. Burner apparatus. 4,428,726, Cl. 431-78.000.
Kimura, Akira; Ishihama, Masao; and Hayakawa, Yoshikazu, to Nissan Motor Co., Ltd. Motor vehicle equipped with engine noise emission preventing device. 4,428,446, Cl. 180-54.00A.
Kindt, Warren W.: *See*—
Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., 4,428,927, Cl. 424-37.000.
King, Charles H., to Boeing Company, The. Lightning protection for external surface composite material of an aircraft. 4,429,341, Cl. 361-117.000.
King, Henry R.: *See*—
Bassett, Noel L.; and King, Henry R., 4,428,504, Cl. 222-55.000.
King, John R. Composition for treating acne, method of manufacturing said composition, and method of treating skin. 4,428,933, Cl. 424-93.000.
King, Michael: *See*—
Cope, Raymond; and King, Michael, 4,428,631, Cl. 312-194.000.
Kinoshita, Takao: *See*—
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Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,428,406, Cl. 140-105.000.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,428,835, Cl. 210-172.000.
Kipp, Ronald W., to RCA Corporation. Tracking filter system for use with a FM/CW radar. 4,429,309, Cl. 343-7.0PL.
Kiriyama, Tsutomu: *See*—
Norota, Susumu; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,429.006, Cl. 428-373.000.
Kirkpatrick, Thomas L. Exercising device. 4,428,578, Cl. 272-136.000.
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Kishi, Yoshio, to Sony Corporation. Stator yoke for electrical apparatus. 4,429,240, Cl. 310-45.000.
Kiso, Noboru: *See*—
Shimizu, Hirozumi; Kiso, Noboru; and Igarashi, Taizo, 4,428,984, Cl. 427-220.000.
Kitahama, Yoshiharu: *See*—
Sakurai, Tokio; Komiya, Kyosuke; Mori, Yoshihiko; Kitahama, Yoshiharu; and Iwami, Isamu, 4,429,171, Cl. 568-804.000.
Klaij, Henri F.: *See*—
Heijenga, Berend; Hilbrink, Hubertus E.; and Klaij, Henri F., 4,428,907, Cl. 422-61.000.
Klauke, Erich: *See*—
Bassner, Bernd; Klauke, Erich; Hagemann, Hermann; and Kuhle, Engelbert, 4,429,154, Cl. 564-278.000.
Kleber, Rolf; and Plabst, Dieter, to Hoechst Aktiengesellschaft. Dressing agents for synthetic fibers and their use. 4,428,846, Cl. 252-8.800.
Kleiner, Walter, to Staeubli Ltd. Pick-finding mechanism with creeping speed. 4,428,404, Cl. 139-1.00E.
Klinger, John C.; and Nesbit, Grayle S., to Atlanta Richfield Company. Recessed astragal for double door. 4,428,153, Cl. 49-366.000.
Klinker, William J.: *See*—
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., 4,428,968, Cl. 426-49.000.
Klockner-Humboldt-Deutz AG: *See*—
Deussner, Herbert; Herchenbach, Horst; Ramesohl, Hubert; and Breidenstein, Wolfgang, 4,428,727, Cl. 431-182.000.
Klomp, Edward D., to General Motors Corporation. Engine with variable flow controlled cellular intake port. 4,428,334, Cl. 123-188.00M.
Klotz, Helmut: *See*—
Dinger, Hans; and Klotz, Helmut, 4,428,192, Cl. 60-606.000.
Knell, Harvey A., to Caterpillar Tractor Co. Load carrying structure and method of manufacture therefor. 4,428,173, Cl. 52-731.000.
Knight, John C.: *See*—
Wovcha, Merle G.; Knight, John C.; and Garcia, Alfred B., 4,429,041, Cl. 435-58.000.
Knolle, Jurgen C.: *See*—
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, 4,428,973, Cl. 427-3.000.
Kobata, Yoshihiro, to Canon Kabushiki Kaisha. Thermal transfer printer. 4,429,318, Cl. 346-76.0PH.
Kobayashi, Hisao: *See*—
Inui, Kenichi; Kobayashi, Hisao; and Funabashi, Tadao, 4,429,356, Cl. 363-56.000.
Kobayashi, Kazuhiro: *See*—
Ito, Akihiko; Kobayashi, Kazuhiro; Tanaka, Hisami; and Ueno, Norio, 4,429,281, Cl. 330-9.000.

Kobayashi, Kiyoaki; and Kumasaka, Taiichi, to Hitachi Koki Company. Holder for supporting a rotary cutting blade. 4,428,120, Cl. 30-390.000.

Kobayashi, Satoru; and Matsue, Shigeki, to Nippon Electric Co., Ltd. Consecutive addressing of a semiconductor memory. 4,429,375, Cl. 365-240.000.

Kobayashi, Tetuo; and Hirai, Syoichi, to Nippon Cable System, Inc. Wire-driving device for window regulator. 4,428,542, Cl. 242-54.00R.

Kobayashi, Toshiaki: *See*—
Murai, Koichi; Kobayashi, Toshiaki; and Fujitani, Kango, 4,429,140, Cl. 549-370.000.

Koch, Charlotte M. Feeding bowl and liner therefor. 4,428,325, Cl. 119-61.000.

Koch Process Systems, Inc.: *See*—
Ryan, James M.; and O'Brien, John V., 4,428,759, Cl. 62-17.000.

Koch, Tad H.; and von Trebra, Robert J., to University Patents, Inc. Stabilizer of organic dye lasers. 4,428,859, Cl. 252-301.170.

Kockler, Barry C.: *See*—
Davis, James W.; DuVall, Dale R.; and Kockler, Barry C., 4,429,333, Cl. 358-293.000.

Kodama, Macayuki; and Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission with overdrive device. 4,428,253, Cl. 74-688.000.

Kodama, Yasuhisa: *See*—
Ohara, Takezi; and Kodama, Yasuhisa, 4,429,241, Cl. 310-51.000.

Koebernick, Wolfgang; and Furtwangler, Hans-Rolf, to Bayer Aktiengesellschaft. Process for the production of known and new 6-amino-6-desoxy-2,3-O-isopropylidene-α-L-sorbofuranose derivatives, and intermediate products of the process. 4,429,117, Cl. 536-17.200.

Koehler, Raymond A.; and Hanson, Bernard M., to UOP Inc. Well screen end fitting assembly and method of making same. 4,428,423, Cl. 166-231.000.

Koerner, Robert F.: *See*—
Chastang, Jean C. A.; and Koerner, Robert F., 4,428,676, Cl. 356-354.000.

Koga, Hiroshi: *See*—
Irikura, Tsutomu; Koga, Hiroshi; and Ito, Akira, 4,429,127, Cl. 544-363.000.

Kohl, Franz; Schnegg, Anton; and Lener, Karl, to Wacker-Chemitronic Gesellschaft fur Electronik-Grundstoffe mbH. Process for polishing indium phosphide surfaces. 4,428,795, Cl. 156-636.000.

Kohler, Karl A., to Container Corporation of America. Automatically erectable liquid-tight tray. 4,428,500, Cl. 220-462.000.

Kohn, Henri A.; and Spahn, Hugo, to Baltek Corporation. Structural laminate with expanded wood core. 4,428,993, Cl. 428-117.000.

Kohyama, Katsuhisa; Sakata, Katsuyuki; and Ono, Shinji, to Mitsubishi Chemical Industries, Limited. Method for preparation of aromatic polyester-polycarbonate. 4,429,103, Cl. 528-176.000.

Kolasa, Michael J.: *See*—
Falkowski, Edmund W.; and Kolasa, Michael J., 4,428,294, Cl. 102-444.000.

Kolpin, Barbara E.; and Brownlee, David C., to Minnesota Mining and Manufacturing Company. Sheet product containing sorbent particulate material. 4,429,001, Cl. 428-283.000.

Komeya, Katsutoshi; Inoue, Hiroshi; Matake, Shigeru; and Endo, Hiroshi, to Tokyo Shibaura Electric Company Limited. Method of making α-silicon nitride powder. 4,428,916, Cl. 423-344.000.

Komiya, Kyosuke: *See*—
Sakurai, Tokio; Komiya, Kyosuke; Mori, Yoshihiko; Kitahama, Yoshiharu; and Iwami, Isamu, 4,429,171, Cl. 568-804.000.

Komori Printing Machinery Co., Ltd.: *See*—
Kataoka, Yoshitaka, 4,428,574, Cl. 271-307.000.

Komula, Raymond W. Environmental heating system. 4,428,363, Cl. 126-439.000.

Koneval, Donald J.: *See*—
Eisele, Walter H.; Krueger, Helmut H. A.; Lajos, Robert E.; and Koneval, Donald J., 4,428,976, Cl. 427-96.000.

Konig, Helmut. Dough molding machine. 4,428,721, Cl. 425-136.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Masuda, Keiji; Fujiwara, Shinobu; and Matsumoto, Kenichi, 4,428,661, Cl. 355-3.0DD.

Konwitza, Vladimir: *See*—
Wittmann, Heinz; and Konwitza, Vladimir, 4,428,597, Cl. 280-626.000.

Koppers Company, Inc.: *See*—
Leston, Gerd, 4,429,168, Cl. 568-755.000.
Leston, Gerd, 4,429,169, Cl. 568-756.000.
Lovell, Robert L., 4,429,170, Cl. 568-761.000.

Kopsco, M. Alan: *See*—
Markow, Edward G.; and Kopsco, M. Alan, 4,428,411, Cl. 152-330.0RF.

Korbelak, Kenneth N.; and Masterson, Joseph B., to GK Technologies, Incorporated. Cable accumulator. 4,428,645, Cl. 350-96.200.

Koshar, Robert J., to Minnesota Mining and Manufacturing Co. Cyclic perfluoroaliphaticdisulfonimides as polymerization catalysts. 4,429,093, Cl. 526-205.000.

Koshiro, Hirotomo: *See*—
Kanai, Masao; and Koshiro, Hirotomo, 4,428,802, Cl. 204-43.00N.

Kosters, Walter C. G., to Shell Oil Company. Process for simultaneous separation of aromatics from heavy and light hydrocarbon streams. 4,428,829, Cl. 208-314.000.

Kothmann, Richard E., to Westinghouse Electric Corp. Minimum loss multilayer electrical winding for induction heating. 4,429,206, Cl. 219-10.790.

Kovacs, Gabor: *See*—
Tomoskozi, Istvan; Szekely, Istvan; Kanai, Karoly; Gyori, Peter; and Kovacs, Gabor, 4,429,123, Cl. 542-426.000.

Kovalovsky, Oscar. Line guide for fishing rods. 4,428,141, Cl. 43-24.000.

Koyama, Kazumi: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; and Ueno, Kouji, 4,429,388, Cl. 371-21.000.

Koyama, Kenzi: *See*—
Higashi, Mitsuo; Morita, Jyun-ichi; Koyama, Kenzi; and Yoshida, Mitsuo, 4,429,021, Cl. 428-629.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Kuhnel, Roland, 4,428,904, Cl. 376-283.000.
Votava, Erwin; Stipsits, Gunter; and Sommer, Richard, 4,428,236, Cl. 73-587.000.

Kramer, Pieter: *See*—
Lambot, Honore J.; Fliervoet, Maria J. H.; and Kramer, Pieter, 4,428,602, Cl. 285-239.000.

Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with fluorinated 1-azolylbutane derivatives. 4,428,949, Cl. 424-245.000.

Kraus, Bernd: *See*—
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.

Kraus, Richard B.; and Musschoot, Albert, to General Kinematics Corporation. Vibratory apparatus. 4,428,476, Cl. 198-764.000.

Krause, Richard J., to AC&R Components, Inc. Oil control system and regulator. 4,428,208, Cl. 62-192.000.

Kraushaar, Stephen N., to Mills Fur Farm Supply, Inc. Fleshing machine. 4,428,210, Cl. 69-46.000.

Krautheim, Preston D.: *See*—
Zudkevitch, David; Belsky, Stephen E.; and Krautheim, Preston D., 4,428,798, Cl. 203-18.000.

Kronenberg, Klaus J., to Trig International, Inc. Fluid treatment device. 4,428,837, Cl. 210-222.000.

Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik: *See*—
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Krotz, Kenneth J., to Western Electric Company, Inc. Process for treating spent fluids to recover copper and copper oxide. 4,428,773, Cl. 75-117.000.

Krueger, Helmut H. A.: *See*—
Eisele, Walter H.; Krueger, Helmut H. A.; Lajos, Robert E.; and Koneval, Donald J., 4,428,976, Cl. 427-96.000.

Krzeminski, Melvin L., to G. D. Searle & Co. Intrauterine contraceptive loading device and method. 4,428,371, Cl. 128-130.000.

Kubo, Seiji; and Ishibashi, Kengi, to Kubo Sekkei, Ltd. Method and apparatus for closing one end of shirred synthetic casing stick and shirred synthetic casing sticks closed. 4,428,402, Cl. 138-118.100.

Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission control system with modified back pressure accumulator. 4,428,258, Cl. 74-867.000.

Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Fail safe automatic transmission lock up clutch control system. 4,428,259, Cl. 74-867.000.

Kubo Sekkei, Ltd.: *See*—
Kubo, Seiji; and Ishibashi, Kengi, 4,428,402, Cl. 138-118.100.

Kuehler, Christopher W.; and Beret, Samil, to Chevron Research Company. Coal liquefaction process with controlled recycle of ethyl acetate-insolubles. 4,428,820, Cl. 208-10.000.

Kuehne, Martin E., to S.A. Omnichem. Azepino[4,5-d]indole derivatives and preparation thereof. 4,428,880, Cl. 260-245.700.

Kuhle, Engelbert: *See*—
Baasner, Bernd; Klauke, Erich; Hagemann, Hermann; and Kuhle, Engelbert, 4,429,154, Cl. 564-278.000.

Kuhn, Friedrich, to J. M. Voith GmbH. Apparatus and method for replacing a finished roll with an empty roll core in a double-drum winder. 4,428,543, Cl. 242-66.000.

Kuhn S.A.: *See*—
Toillie, Alain; and Rostoucher, Guy, 4,428,185, Cl. 56-295.000.

Kuhnel, Roland, to Kraftwerk Union Aktiengesellschaft. Blow-off device for limiting excess pressure in nuclear power plants, especially of the boiling water reactor-type. 4,428,904, Cl. 376-283.000.

Kuka Schweissanlagen & Roboter GmbH: *See*—
Tradt, Hans R., 4,429,266, Cl. 318-568.000.

Kumar-Misir, Victor. Information gathering system. 4,428,733, Cl. 434-363.000.

Kumasaka, Taiichi: *See*—
Kobayashi, Kiyoaki; and Kumasaka, Taiichi, 4,428,120, Cl. 30-390.000.

Kunkel, Wolfgang; Kemnade, Jorg; and Schneider, Dietrich, to Degussa Aktiengesellschaft. Continuous process for the production of hydrogen peroxide according to the anthraquinone process. 4,428,923, Cl. 423-588.000.

Kunz, Walter: *See*—
Hubele, Adolf; Riebli, Peter; Eckhardt, Wolfgang; and Kunz, Walter, 4,428,964, Cl. 424-309.000.

Kuramochi, Koujiro: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,258, Cl. 74-867.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,259, Cl. 74-867.000.

Kuraoka, Yasuo, to Hoxan Corporation. Apparatus for measuring melting point and boiling point of gas. 4,428,684, Cl. 374-25.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Murayama, Naohiro; Sakagami, Teruo; and Shoji, Masuhiro, 4,428,873, Cl. 252-583.000.

Kurii, Hajime, to Tokyo Shibaura Denki Kabushiki Kaisha. Microprogram-testing apparatus. 4,429,368, Cl. 364-580.000.

Kurita, Yukio; and Nakagawa, Satoshi, to Matsushita Electric Works, Ltd. Method of forming a structural column. 4,428,792, Cl. 156-196.000.

Kurtz, Alfred B.: *See*—
Findl, Eugene; and Milch, Peter O., 4,428,366, Cl. 128-15.000.

Kurtz, Robert J.: *See*—
Findl, Eugene; and Milch, Peter O., 4,428,366, Cl. 128-15.000.

Kuwayama, Takeshi: *See*—
Tokuhara, Mitsuhiro; Yamada, Yu; Takemura, Yukio; Kuwayama, Takeshi; and Seto, Susumu, 4,429,353, Cl. 362-232.000.

Kuzin, Anatoly I.: *See*—
Dubrovsky, Evgeny V.; Averkiev, Leonid A.; Dunaev, Viktor P.; Kuzin, Anatoly I.; Martynova, Natalya I.; Folts, Lev A.; Shmelev, Arthur P.; Vronsky, Sergei S.; and Vasiliev, Evgeny V., 4,428,419, Cl. 165-151.000.

Kuzminski, Henry W., to RCA Corporation. Color picture tube having improved slit type shadow mask and method of making same. 4,429,028, Cl. 430-5.000.

Kwan, Gerald A.; Lehne, John; and Wooten, Ronald E., to Le Van Specialty Co., Inc. Releasable hinge device for removable panels. 4,428,155, Cl. 49-465.000.

Kwan, Gerald A.: *See*—
Wooten, Ronald E.; and Kwan, Gerald A., 4,428,170, Cl. 52-217.000.

Kyorin Pharmaceutical Co., Ltd.: *See*—
Irikura, Tsutomu; Koga, Hiroshi; and Ito, Akira, 4,429,127, Cl. 544-363.000.

Kyushima, Tatsuo: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,258, Cl. 74-867.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,259, Cl. 74-867.000.

Laber, Georg: *See*—
Berner, Heinz; Turnowsky, Friederike; Laber, Georg; and Hildebrandt, Johannes, 4,428,953, Cl. 424-263.000.

LaCroix, Stephen R.: *See*—
Stokes, Richard F.; Timm, James D.; LaCroix, Stephen R.; and Adams, Milton R., 4,428,194, Cl. 60-39.020.

Lacy, James P.; and Bailey, Edmond L., to Waterchek, Inc. Method of improving oil/water production ratio. 4,428,424, Cl. 166-253.000.

Lacy, Robert M.: *See*—
Taylor, Benjamin J.; and Lacy, Robert M., 4,428,857, Cl. 252-193.000.

Lagher, Gunnar H., to A.O. Arkitektkontor AB, a part interest. Pipe parting apparatus. 4,428,118, Cl. 30-92.000.

Lagowski, Jacek: *See*—
Jastrzebski, Lubomir L.; and Lagowski, Jacek, 4,429,047, Cl. 436-4.000.

Lahoda, Edward J., to Westinghouse Electric Corp. Purification of silicon. 4,428,917, Cl. 423-350.000.

Lai Chen, Sow-Mei: *See*—
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Lajos, Robert E.: *See*—
Eisele, Walter H.; Krueger, Helmut H. A.; Lajos, Robert E.; and Koneval, Donald J., 4,428,976, Cl. 427-96.000.

Lake Chemical Co.: *See*—
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Lambot, Honore J.; Fliervoet, Maria J. H.; and Kramer, Pieter, to Societe Anonyme Diamant Boart. Inner tube element for a double tube coring apparatus and process for the manufacture of this tube element. 4,428,602, Cl. 285-239.000.

Landry, Darrell J.; and Porter, James E., to Baker International Corporation. Perforable screen device for subterranean wells and method of producing multi-lobe zones. 4,428,431, Cl. 166-298.000.

Lane, Christopher D.; and Rowe, Rodney A., to Rolls Royce Limited. Fuel combustion in ducted flow. 4,428,191, Cl. 60-737.000.

Lane, Edward S.: *See*—
Cairns, James A.; Lane, Edward S.; Prentice, Thomas C.; Segal, David L.; and Sammon, David C., 4,428,864, Cl. 502-151.000.

Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Comparator for the control circuit of an automatic steering installation. 4,428,449, Cl. 180-131.000.

Langer, Hans-Joachim: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Noller, Christoph, 4,428,347, Cl. 123-453.000.

Lanier, Lynn H.: *See*—
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Larkin, William J. Solar heating system. 4,428,362, Cl. 126-434.000.

LaRocca, Joseph M. Method of manufacture and assembly of extruded aluminum salt for roller shutter. 4,428,218, Cl. 72-256.000.

Larson, Elmer M., Jr.: *See*—
Clemens, Donald D.; Larson, Elmer M., Jr.; Morgan, William T.; Steele, Oliver P., III; and Wright, Fred R., 4,429,329, Cl. 358-100.000.

Larsson, Olof, to R. O. L. Inredningar AB. Fastening device for screen or wall panels. 4,428,172, Cl. 52-489.000.

Larsson, Rolf: *See*—
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Laskow, Vlodek: *See*—
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Last, Daniel F., to General Motors Corporation. Automatic adjustment mechanism for a cable drive. 4,428,251, Cl. 74-501.50R.

Laudano, Raymond J., to General Foods Corporation. Multi-colored freeze-dried coffee and a process for producing the same. 4,428,970, Cl. 426-385.000.

Laughman, Lanny M.: *See*—
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Laurel Bank Machine Co., Ltd.: *See*—
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Hibari, Eikoh, 4,429,408, Cl. 377-8.000.
Osako, Kyoichi, 4,428,501, Cl. 221-13.000.

Laurent, Jean, to Institut Francais du Petrole. Device provided with retractable arms for the anchoring of an instrument in a cavity. 4,428,422, Cl. 166-212.000.

Law, Derek A.; and Shim, Joosup, to Mobil Oil Corporation. Oil-in-water emulsion fluids. 4,428,855, Cl. 252-77.000.

Lawson, Jack O. Boat seat fishing accessory-arm rest support assembly. 4,428,617, Cl. 297-188.000.

Layden, George K., to United Technologies Corporation. Transfer molding method of producing fiber reinforced glass matrix composite articles. 4,428,763, Cl. 65-4.210.

Layh, Hans-Dieter. Arrangement of actual value indicator. 4,429,242, Cl. 310-71.000.

Lazar, Laszlo: *See*—
Pasztor, Emil; Lazar, Laszlo; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,429,062, Cl. 523-118.000.

Le Van Specialty Co., Inc.: *See*—
Kwan, Gerald A.; Lehne, John; and Wooten, Ronald E., 4,428,155, Cl. 49-465.000.
Wooten, Ronald E.; and Kwan, Gerald A., 4,428,170, Cl. 52-217.000.

LeBlanc, Gerard J.: *See*—
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Lech, Jerome F.: *See*—
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Ledoux, Francis X.: *See*—
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Lee, George A.; and Hickner, Richard A., to Dow Chemical Company, The. Composition containing polymerizable entities having oxirane groups and terminal olefinic unsaturation in combination with free-radical and cationic photopolymerizations means. 4,428,807, Cl. 204-159.140.

Lee, Kyu H.; and Porter, Christopher H., to Extracorporeal Medical Specialties, Inc. Conduit having spirally wound monofilament material. 4,428,403, Cl. 138-130.000.

Lee, Kyu-Wang; Peffer, John R.; Piccirilli, Robert; and Chang, Wen-Hsuan, to PPG Industries, Inc. Film-forming resins containing alkoxy silane groups. 4,429,082, Cl. 525-426.000.

Lee, Robert C., to Bell Telephone Laboratories, Incorporated. Fault and error detection arrangement. 4,429,391, Cl. 371-49.000.

Lee, Shy-Fuh, to Zoecon Corporation. 3-Alkoxy-4-substituted-phenoxy-2,3-unsaturated acids, esters and derivatives. 4,429,167, Cl. 568-636.000.

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Leston, Gerd, to Koppers Company, Inc. Process for separating isopropylated m-cresols. 4,429,169, Cl. 568-756.000.
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Levy, Stanley B., to Du Pont de Nemours, E. I., and Company. Microgrooved processing roll and method for heat treating sheet film using same. 4,428,724, Cl. 425-446.000.
Lewandowski, Franklin D.: *See*—
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Liquid Carbonic Corporation: *See*—
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Mann, Charlton W., to United States of America, National Aeronautics and Space Administration. Rotary target V-block. 4,428,122, Cl. 33-293.000.

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Marsella, Gino: *See*—
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Martin, Dennis R., to Denmar Engineering & Control Systems, Inc. Vending machine for insuring the dispensing of newspapers and the like one at a time. 4,428,503, Cl. 221-232.000.

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Dubrovsky, Evgeny V.; Averkiev, Leonid A.; Dunaev, Viktor P.; Kuzin, Anatoly I.; Martynova, Natalya I.; Folts, Lev A.; Shmelev, Arthur P.; Vronsky, Sergei S.; and Vasiliev, Evgeny V., 4,428,419, Cl. 165-151.000.

Maruyama, Hisaichi; and Matsumoto, Yasuji, to Mitsubishi Denki Kabushiki Kaisha. Sewing machine-pattern data processor. 4,429,364, Cl. 364-400.000.

Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, to Montedison S.p.A. Mica-reinforced polyolefin compositions comprising a maleammic silane modifier. 4,429,064, Cl. 523-213.000.

Masaaki, Matsushita; and Tetsuo, Terado, to UBE Industries, Ltd. Process for firmly bonding a thermoplastic covering sheet on a hard article. 4,428,789, Cl. 156-85.000.

Masatomi, Tsunehiko: *See*—
Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, 4,429,164, Cl. 568-377.000.

Masco Corporation of Indiana: *See*—
Stow, Mark, 4,429,025, Cl. 429-97.000.

Massa, Frank, to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Means for detecting the accumulation of frost in a low temperature refrigeration system. 4,428,206, Cl. 62-140.000.

Massucco, Arthur A., to Arthur D. Little, Inc. Optically transparent radiation shielding material. 4,429,094, Cl. 526-240.000.

Masterson, Joseph B.: *See*—
Korbelak, Kenneth N.; and Masterson, Joseph B., 4,428,645, Cl. 350-96.200.

Mastic Corporation: *See*—
Malm, Douglas N.; and Hall, James D., 4,428,156, Cl. 49-501.000.

Masuda, Keiji; Fujiwara, Shinobu; and Matsumoto, Kenichi, to Konishiroku Photo Industry Co., Ltd. Magnetic brush type developing device. 4,428,661, Cl. 355-3.0DD.

Masuda, Naosuke; Tobisawa, Yoshio; and Fujii, Tadaaki, to Jidosha Kiki Co., Ltd. Power steering apparatus. 4,428,399, Cl. 137-625.220.

Masuda, Nobuhito: *See*—
Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, 4,429,050, Cl. 436-538.000.

Masuda, Shigeru: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,429,198, Cl. 200-144.00R.

Masuda, Yoshimichi; Watanabe, Ryuzo; Imura, Shinichi; and Sakiyama, Kazutaka, to Toyo Soda Manufacturing Co., Ltd. Process for producing metallic chromium plates and sheets. 4,428,778, Cl. 148-11.50P.

Masuzawa, Sigeaki; and Tanimoto, Akira, to Sharp Kabushiki Kaisha. Data-related apparatus with a speech-synthesizer output device. 4,429,182, Cl. 381-51.000.

Matake, Shigeru: *See*—
Komeya, Katsutoshi; Inoue, Hiroshi; Matake, Shigeru; and Endo, Hiroshi, 4,428,916, Cl. 423-344.000.

Mateika, Dieter; and Bartels, Gunter, to U.S. Philips Corporation. Magnetic hexagonal ferrite layer on a nonmagnetic hexagonal mixed crystal substrate. 4,429,052, Cl. 501-135.000.

Materials Research Corporation: *See*—
Class, Walter H.; Hieronymi, Robert G.; and Hurwitt, Steven D., 4,428,816, Cl. 204-298.000.

Mathieu, Julien C., to Dayco Corporation. Electrically heated fluid conduit. 4,429,213, Cl. 219-301.000.

Matsue, Shigeki: *See*—
Kobayashi, Satoru; and Matsue, Shigeki, 4,429,375, Cl. 365-240.000.

Matsui, Takeshi: *See*—
Odogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,428,558, Cl. 251-65.000.

Matsumoto, Kenichi: *See—*
Masuda, Keiji; Fujiwara, Shinobu; and Matsumoto, Kenichi, 4,428,661, Cl. 355-3.0DD.

Matsumoto, Kojiro: *See—*
Mishiba, Saburo; Ohta, Kiyonari; Fujieda, Kazumasa; Matsumoto, Kojiro; and Uchida, Akira, 4,429,074, Cl. 524-819.000.

Matsumoto, Shigeyuki, to Canon Kabushiki Kaisha. Liquid jet recording device. 4,429,321, Cl. 346-140.00R.

Matsumoto, Sinji, to Fuji Xerox Co., Ltd. Roller type fixing unit for a copying machine. 4,428,660, Cl. 355-3.0FU.

Matsumoto, Yasuji: *See—*
Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,429,364, Cl. 364-400.000.

Matsunaga, Yukio A.: *See—*
Van Erden, Donald L.; Gould, Russell J.; and Matsunaga, Yukio A., 4,428,720, Cl. 425-66.000.

Matsuoka, Kikuo: *See—*
Hirota, Kazumi; Tsutsumi, Yotaro; Itoh, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; Hori, Ichiro; and Hayashi, Toshihiko, 4,428,494, Cl. 220-270.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,428,406, Cl. 140-105.000.
Kimpara, Nobuyuki; Kaneko, Hideki; and Moriya, Yoshifumi, 4,428,726, Cl. 431-78.000.
Sugita, Ryuji, 4,429,016, Cl. 428-692.000.
Yashiki, Tomohiro; Hosomi, Fumio; Wakahata, Yasuo; Nishino, Atsushi; Wasa, Kiyotaka; and Katase, Masazumi, 4,428,909, Cl. 422-95.000.

Matsushita Electric Works, Ltd.: *See—*
Horii, Sadashige; Imai, Hirozoh; and Hamashima, Tetsuo, 4,428,117, Cl. 30-43.910.
Kurita, Yukio; and Nakagawa, Satoshi, 4,428,792, Cl. 156-196.000.

Matsuyama, Yoji: *See—*
Yamagata, Tetsuo; Sato, Morio; Ogishima, Tetsuo; and Matsuyama, Yoji, 4,428,227, Cl. 73-115.000.

Matthe, Herman L.; Van Gossum, Lucien J.; and Mertens, Ludovicus M., to Agfa-Gevaert N.V. Surface-treated vinyl chloride polymer material including an adhering hydrophilic layer. 4,429,032, Cl. 430-231.000.

Maturo, Robert J.: *See—*
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., 4,429,415, Cl. 455-164.000.

Maus, Julius, to Gretsch-Unitas GmbH. Ventilation register. 4,428,279, Cl. 98-98.000.

Mayer, Andreas; and Schwarz, Martin, to BBC Brown, Boveri & Co., Ltd. Process for operating an internal-combustion engine with a supercharger which can be cut out, and a device for carrying out the process. 4,428,352, Cl. 123-559.000.

Mayer, Paul C., to Oy Fiskars AB. Knife scabbard with integral blade sharpener. 4,428,515, Cl. 224-232.000.

Mayer, Werner, to Translift AG; and Translift Gesellschaft fur Hebe- und Forderanlagen mbH. Control current transmitter in form of contactor means which yieldingly engage a control current track for a chassis in transport systems. 4,428,466, Cl. 191-58.000.

Mazzagatti, Roy P., to Texaco Inc. Oil-water monitor. 4,429,273, Cl. 324-61.00R.

Mazzei, Alessandro: *See—*
Pedretti, Ugo; Lugli, Gabriele; Poggio, Sergio; and Mazzei, Alessandro, 4,429,089, Cl. 526-153.000.

McAvinn, James D.; and Li, Felipe S., to Kendall Company, The. Device for supporting sponge collection bags. 4,428,488, Cl. 211-181.000.

McBride, Paul: *See—*
Good, Raymond H.; and McBride, Paul, 4,429,158, Cl. 564-455.000.

McBroom, Kendall R.; and Shah, Dhanendra C., to Donaldson Company, Inc. Fluid filter with integral viscous damper. 4,428,834, Cl. 210-131.000.

McCabe, Barkman C.; Zajac, Edward; and Featherstone, John L., to Magma Power Company. Geothermal plant fluid reinjection system. 4,428,200, Cl. 60-641.500.

McCullough, John W.: *See—*
Hoffman, Roy L.; Kempke, William G.; McCullough, John W.; Soltis, Frank G.; and Turner, Richard T., 4,429,360, Cl. 364-200.000.

McDonnell Douglas Corporation: *See—*
Boehringer, Wilfred E., 4,428,196, Cl. 60-403.000.

McDonough, Suellen. Multiple section wastebasket and the like. 4,428,493, Cl. 220-20.000.

McEwen, Stephen N.: *See—*
Creps, John L.; Hainen, Timothy J.; and McEwen, Stephen N., 4,428,838, Cl. 210-323.200.

McGlashan, Kenneth W., to RCA Corporation. Pincushion raster corrector distortion with improved performance. 4,429,293, Cl. 335-211.000.

McGregor, John C., Jr., to Pentaflex, Inc. Retainer and bearing assembly. 4,428,688, Cl. 384-208.000.

McGuire, Howard R.; and Offutt, Carl R., to Whirlpool Corporation. Bushing mounted stirrer shaft. 4,429,204, Cl. 219-10.55F.

McKee, Glenda D. Protective transparent face and neck shield. 4,428,079, Cl. 2-174.000.

McLaurin, A. Porter: *See—*
Jones, Edwin R., Jr.; Cathey, LeConte; and McLaurin, A. Porter, 4,429,328, Cl. 358-88.000.

McNatt, Robert B.; and Day, John T., to Rubber Millers, Inc. Force-absorbing device. 4,428,568, Cl. 267-140.000.

McPhee, William A., to Dresser Industries, Inc. Perforating apparatus energy absorber and explosive charge holder. 4,428,440, Cl. 175-4.600.

Mead Corporation, The: *See—*
Davis, James W.; DuVall, Dale R.; and Kockler, Barry C., 4,429,333, Cl. 358-293.000.
Dressler, John L.; Ganguly, Biswa N.; and VanBreemen, Bertram, 4,429,322, Cl. 346-140.00R.
Rogers, Calvin; Parker, Russell A.; and Loucks, Terry L., 4,429,049, Cl. 436-178.000.

Mechanical Technology Incorporated: *See—*
Shapiro, Wilbur, 4,428,584, Cl. 277-3.000.

Medtronic, Inc.: *See—*
Anderson, Kenneth M.; and Brumwell, Dennis A., 4,428,378, Cl. 128-419.0PG.
Hepp, Dennis G., 4,428,381, Cl. 128-715.000.

Meffert, Harald; and Pieper, Rolf, to W. Meffert KG., Firma. Coil form for electric windings. 4,429,294, Cl. 336-198.000.

Meischen, Sandra J.; Gale, Glen R.; and Naff, Marion B., to United States of America, Health and Human Services. (N-Phosphonacetyl-L-aspartato) (1,2-diaminocyclohexane)platinum(II) or alkali metal salt. 4,428,943, Cl. 424-211.000.

Meisei Electric Co., Ltd.: *See—*
Sato, Satoshi; Takahashi, Hiroshi; and Nakamura, Tsutomu, 4,428,793, Cl. 156-285.000.

Melde-Tuczai, Helmut: *See—*
Skatsche, Othmar; Feichtinger, Gerhard; Melde-Tuczai, Helmut; and Schukoff, Bruno, 4,428,338, Cl. 123-198.00E.

Melling, Elmer M.: *See—*
Johnson, Robert M.; and Melling, Elmer M., 4,428,775, Cl. 106-90.000.

Mendez, Antonio. Glaucoma treatment device. 4,428,746, Cl. 604-8.000.

Menown, Hugh: *See—*
Donaldson, Timothy P.; Neale, Christopher V.; and Menown, Hugh, 4,429,253, Cl. 313-573.000.

Merck & Co., Inc.: *See—*
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,429,042, Cl. 435-119.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,428,956, Cl. 424-270.000.
Cragoe, Edward J., Jr.; and Rooney, Clarence S., 4,428,959, Cl. 424-274.000.
Durette, Philippe L., 4,429,118, Cl. 536-17.200.
Heck, James V., 4,428,960, Cl. 424-274.000.
Sandford, Paul A., 4,429,121, Cl. 536-123.000.
Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, 4,428,931, Cl. 424-87.000.

Merck Sharp & Dohme (I.A.) Corp.: *See—*
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,428,956, Cl. 424-270.000.

Mericle, Robert W., to Ethicon Inc. Plastic surgical staple. 4,428,376, Cl. 128-335.000.

Merritt, Richard F.: *See—*
Gioeni, Mary L.; and Merritt, Richard F., 4,429,070, Cl. 524-517.000.

Merten, Rudolf: *See—*
Giesecke, Henning; Mertes, Rudolf; and Rottmaier, Ludwig, 4,429,135, Cl. 548-264.000.

Mertens, Ludovicus M.: *See—*
Matthe, Herman L.; Van Gossum, Lucien J.; and Mertens, Ludovicus M., 4,429,032, Cl. 430-231.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Gelhard, Manfred, 4,428,705, Cl. 411-82.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Engelsberger, Ernst; Schulz, Ralf-Thilo; and Drachenberg, Franz, 4,428,157, Cl. 49-502.000.

Metallurgie Hoboken-Overpelt: *See—*
Maes, Robert H.; Delvaux, Andre L.; and Lenoir, Pierre J., 4,428,731, Cl. 432-247.000.

Metallwerk Max Brose GmbH & Co.: *See—*
Becker, Herbert; Sunkel, Manfred; Grams, Volker; and Schelhorn, Gerhard, 4,428,250, Cl. 74-425.000.

Metcalfe, Lincoln D.: *See—*
Frank, Dieter; and Metcalfe, Lincoln D., 4,429,023, Cl. 428-694.000.

Metric Systems Corporation: *See—*
Woram, Bryon L.; and Hall, James M., 4,428,551, Cl. 244-137.00R.

Meyer, David A. G. Educational and amusement apparatus. 4,428,732, Cl. 434-160.000.

Meyerle, Michael; and Ehrlinger, Friedrich, to Zahnradfabrik Friedrichshafen AG. Motor vehicle control for an infinitely variable transmission. 4,428,257, Cl. 74-866.000.

Micafil AG: *See—*
Fischer, Bruno; and Andretta, Angelo, 4,428,113, Cl. 29-736.000.

Microdyne Corporation: *See—*
Hooper, Robert L., 4,429,418, Cl. 455-314.000.

Midland-Ross Corporation: *See—*
Dekkers, Leo P.; and Spencer, James R., 4,429,201, Cl. 200-159.00A.

Hanula, Richard M., 4,428,489, Cl. 213-62.00A.
Midwest Conveyor Co., Inc.: *See*—
Burt, Harold S., 4,428,708, Cl. 414-275.000.
Mihara, Yuji: *See*—
Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, 4,429,050, Cl. 436-538.000.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Ishida, Takashi; and Tominari, Noboru, 4,428,891, Cl. 261-65.000.
Milberger, Ernest C.: *See*—
Blum, Patricia R.; Milberger, Ernest C.; Bremer, Noel J.; and Dria, Dennis E., 4,429,137, Cl. 549-259.000.
Milch, Peter O.: *See*—
Findl, Eugene; and Milch, Peter O., 4,428,366, Cl. 128-15.000.
Miles Laboratories, Inc.: *See*—
Boguslawski, George; and Boyer, Ernest W., 4,429,044, Cl. 435-220.000.
Milgram, Alvin, to Fairchild Camera and Instrument Corporation. Adhesion bond-breaking of lift-off regions on semiconductor structures. 4,428,796, Cl. 156-637.000.
Miller, Albert J., to Atlas Electronics International, Inc. Dice agitation and casting apparatus. 4,428,579, Cl. 273-145.0CA.
Miller, George A.; and Pridgen, Lendon N., to Rohm and Haas Company. Novel heterocyclic compounds. 4,428,948, Cl. 424-244.000.
Miller, Ira: *See*—
Davies, Robert B.; and Miller, Ira, 4,429,270, Cl. 323-317.000.
Miller, R. J. Cooking grill. 4,428,281, Cl. 99-445.000.
Miller, Richard C.: *See*—
De Loach, Bernard C., Jr.; Miller, Richard C.; and Schwartz, Bertram, 4,429,231, Cl. 250-551.000.
Miller, Thomas W.: *See*—
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,429,042, Cl. 435-119.000.
Miller, Wendell D.: *See*—
Berry, Peter F.; Miller, Wendell D.; and Nethery, John L., Jr., 4,429,409, Cl. 378-45.000.
Milliken Research Corporation: *See*—
Via, Ralph H., 4,428,751, Cl. 8-477.000.
Millington, Arthur R., to Linton Medical Services Limited. Preparation for diagnostic radiology. 4,428,924, Cl. 424-4.000.
Mills Fur Farm Supply, Inc.: *See*—
Kraushaar, Stephen N., 4,428,210, Cl. 69-46.000.
Minerd, Timothy M.: *See*—
Phelps, Russell L.; Stemmle, Denis J.; and Minerd, Timothy M., 4,428,666, Cl. 355-14.0SH.
Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheel assemblies for use with wheelchairs. 4,428,594, Cl. 280-242.0WC.
Minner, Willy, to Telefunken Electronic GmbH. Input stage for an ignition control circuit. 4,429,235, Cl. 307-356.000.
Minnesota Mining and Manufacturing Co.: *See*—
Arens, Robert P., 4,428,321, Cl. 116-217.000.
Chang, Robert W. H., 4,428,930, Cl. 424-52.000.
Kolpin, Barbara E.; and Brownlee, David C., 4,429,001, Cl. 428-283.000.
Koshar, Robert J., 4,429,093, Cl. 526-205.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ito, Hideo; Irie, Yutaka; and Nakamura, Minoru, 4,428,663, Cl. 355-14.00R.
Mirmikidis, Alexander Peter: *See*—
Williams, Ronald H.; Elliott, Mason T.; and Moss, Leonard S., 4,428,280, Cl. 99-356.000.
Mironenko, Ljudmila A.: *See*—
Pasmannik, Vitaly I.; Mironenko, Ljudmila A.; and Nazarov, Sergei N., 4,429,255, Cl. 315-5.390.
Miser, H. T.: *See*—
Pippert, Aaron J.; and Miser, H. T., 4,428,590, Cl. 277-188.00A.
Mishiba, Saburo; Ohta, Kiyonari; Fujieda, Kazumasa; Matsumoto, Kojiro; and Uchida, Akira, to Sumitomo Naugatuck Co., Ltd. Paper coating composition and its production. 4,429,074, Cl. 524-819.000.
Mita, Tsunemasa, to Fuji Xerox Co., Ltd. Thermal recording print head. 4,428,690, Cl. 400-120.000.
Mitnick, Victor H.: *See*—
Adrian, James M.; and Mitnick, Victor H., 4,429,185, Cl. 179-18.0FA.
Mito, Akio; and Tanaka, Kentaro, to Tokyo Keiki Co., Ltd. Pressure control valve. 4,428,398, Cl. 137-530.000.
Mitsubishi Chemical Industries, Limited: *See*—
Kohyama, Katsuhisa; Sakata, Katsuyuki; and Ono, Shinji, 4,429,103, Cl. 528-176.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hattori, Takatoshi, 4,428,112, Cl. 29-734.000.
Maruyama, Hisaichi; and Matsumoto, Yasuji, 4,429,364, Cl. 364-400.000.
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,429,198, Cl. 200-144.00R.
Mitsubishi Gas Chemical Co., Inc.: *See*—
Gaku, Morio; Nagai, Syunichi; Kimpara, Hidenori; and Ayano, Satoshi, 4,429,112, Cl. 528-422.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo, 4,428,467, Cl. 192-3.310.
Mitsubishi Rayon Co., Ltd.: *See*—
Sugimori, Teruhiko; and Habara, Hideaki, 4,429,114, Cl. 528-486.000.
Mitsuhashi, Susumu: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Shibata, Yuzo; and Naganuma, Seikoh, 4,429,079, Cl. 525-240.000.
Mittelmann, Gerhard; and Brodbeck, Klaus P., to Swiss Aluminium Ltd. Freight container, in particular for air transport. 4,428,491, Cl. 220-1.500.
Mitutoyo Mfg. Co., Ltd.: *See*—
Yamazaki, Kunio, 4,428,121, Cl. 33-172.00B.
Miura, Ieaki, to Tokico Ltd. Hydraulic damper. 4,428,464, Cl. 188-315.000.
Miyagawa, Hiroshi: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,429,197, Cl. 200-144.00B.
Miyagi, Toshimi, to Murata Manufacturing Co., Ltd. Flyback transformer. 4,429,358, Cl. 363-68.000.
Miyajima, Hajime, to Toko, Inc. Group-arranged type surface acoustic wave transducer. 4,429,246, Cl. 310-313.00B.
Miyazaki, Yoshihisa: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,428,274, Cl. 91-369.00A.
Miyoshi, Yasushi; and Ishii, Yasuhiro, to Sanyo Electric Co. Ltd. Diaphragm for speaker. 4,428,996, Cl. 428-198.000.
Mizorogi, Hirotsugu: *See*—
Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, 4,428,979, Cl. 427-162.000.
Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, 4,428,980, Cl. 427-162.000.
Mizuguchi, Hidenori: *See*—
Taki, Hiroyuki; Mizuguchi, Hidenori; and Ota, Hiroshi, 4,428,621, Cl. 303-13.000.
Mobil Oil Corporation: *See*—
Allen, Linus S., 4,429,221, Cl. 250-256.000.
Bridger, Robert F., 4,428,861, Cl. 252-32.70E.
Chester, Arthur W.; and Chu, Yung F., 4,429,176, Cl. 585-481.000.
Choi, Byung C.; Gross, Benjamin; and Malladi, Madhava, 4,428,824, Cl. 208-86.000.
Dellinger, Thomas B., 4,428,441, Cl. 175-61.000.
Derbyshire, Frank J.; and Whitehurst, Darrell D., 4,428,818, Cl. 208-8.0LE.
Law, Derek A.; and Shim, Joosup, 4,428,855, Cl. 252-77.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,428,865, Cl. 502-77.000.
Shu, Paul; and Yan, Tsoung-Yuan, 4,428,819, Cl. 208-46.000.
Walsh, Dennis E., 4,428,826, Cl. 208-120.000.
Mock, Curtis D.: *See*—
Mock, Sam D., Jr.; and Mock, Curtis D., 4,429,212, Cl. 219-268.000.
Mock, Sam D., Jr.; and Mock, Curtis D. Disposable electric lighter. 4,429,212, Cl. 219-268.000.
Moll, Franz; and Holl, Ingeborg, to Agfa Gevaert Aktiengesellschaft. Process for concentrating yellow silver sols. 4,429,038, Cl. 430-510.000.
Mongeon, Robert J.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; Drinkwater, Erroll H.; and Laughman, Lanny M., 4,429,398, Cl. 372-64.000.
Monsanto Company: *See*—
Cutchens, Charles E.; and Lanier, Lynn H., 4,429,159, Cl. 564-492.000.
Sikorski, James A.; and Curtis, Tommie G., 4,428,765, Cl. 71-87.000.
Tou, Jacob S.; and Schleppnik, Alfred A., 4,428,887, Cl. 260-465.00D.
Montedison S.p.A.: *See*—
Agnes, Giovanni; Rucci, Guglielmo; and Santini, Claudio, 4,429,147, Cl. 560-81.000.
Marzola, Roberto; Garagnani, Enea; and Moro, Alessandro, 4,429,064, Cl. 523-213.000.
Montierth, Max R., to Corning Glass Works. Solid particulate filters. 4,428,758, Cl. 55-523.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Use of methyl substituted pinyl oxopentenes, for augmenting, enhancing of modifying the aroma or taste of smoking tobacco and smoking tobacco articles. 4,428,387, Cl. 131-276.000.
Moore, George E. Infinitely variable ratio transmission apparatus. 4,428,740, Cl. 474-242.000.
Moore, M. Samuel; and Paluka, Charles F., to Semco Instruments, Inc. Turbocharger control system. 4,428,199, Cl. 60-600.000.
Moore, Michael H.; and Turner, George F. A. M., to Ciba-Geigy AG. Combined film cassette unloading and film processing device. 4,428,658, Cl. 354-310.000.
Morales, Alvaro, to Queen's University of Kingston. Device for measuring male potency. 4,428,385, Cl. 128-774.000.
Moreno, Jack, to Blackstone Industries, Inc. Adjustable, portable, hand-held impactor. 4,428,439, Cl. 173-118.000.
Morgan, William T.: *See*—
Clemens, Donald D.; Larson, Elmer M., Jr.; Morgan, William T.; Steele, Oliver P., III; and Wright, Fred R., 4,429,329, Cl. 358-100.000.
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Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Power switchgear. 4,429,198, Cl. 200-144.00R.

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Davies, Robert B.; and Miller, Ira, 4,429,270, Cl. 323-317.000.
Gay, Michael J., 4,429,239, Cl. 307-520.000.
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Erhard, Werner, 4,428,333, Cl. 123-149.00C.

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Young, John A.; and Munson, Richard E., 4,428,425, Cl. 166-267.000.

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Heimbach, Klaus J.; Munz, Wolf-Dieter; Adam, Rolf; and Wenzl, Heinz, 4,428,809, Cl. 204-192.00P.

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Murata Manufacturing Co., Ltd.: *See*—
Miyagi, Toshimi, 4,429,358, Cl. 363-68.000.
Nakatsu, Yoshiyuki, 4,429,297, Cl. 338-162.000.

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Peyman, Gholam A.; Raichand, Notilal; and Murray, Edward J., 4,428,748, Cl. 604-22.000.

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Meischen, Sandra J.; Gale, Glen R.; and Naff, Marion B., 4,428,943, Cl. 424-211.000.

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Gaku, Morio; Nagai, Syunichi; Kimpara, Hidenori; and Ayano, Satoshi, 4,429,112, Cl. 528-422.000.

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Naitoh, Katsumi, to NSK-Warner K.K. Safety belt system having retractor equipped with manual locking mechanism. 4,428,545, Cl. 242-107.40A.

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Nakagawa, Masachi: *See*—
Darko, Laszlo L.; Nakanishi, Koji; and Nakagawa, Masachi, 4,429,141, Cl. 549-382.000.

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Nakahira, Akitaro, to Hohyu Rubber Co., Ltd. Rubber material. 4,429,068, Cl. 524-302.000.
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Nakamura, Hajime; Iwamura, Junichi; Nakajima, Yoshio; and Hasegawa, Masaji, 4,428,245, Cl. 73-864.520.
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Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, to Ulvac Seimaku Kabushiki Kaisha. Method for forming an inhomogeneous optical layer. 4,428,979, Cl. 427-162.000.
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Napp Systems (USA), Inc.: *See*—
Howard, Lawrence E., 4,428,659, Cl. 354-317.000.
Narimatsu, Akihisa; and Ohkubo, Hiroyuki, to Sony Corporation. Magnetoresistive displacement sensor and signal reprocessing circuits therefor. 4,429,276, Cl. 324-207.000.
Narita, Osamu; and Hayashi, Takushi, to Victor Company of Japan, Ltd. Disc accommodating case. 4,428,483, Cl. 206-459.000.
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Smith, David W., 4,429,056, Cl. 518-700.000.
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Brindley, Robert J.; Taravella, Salvatore R.; and Dean, Robert M., 4,429,214, Cl. 219-345.000.
Johnson, Robert M.; and Melling, Elmer M., 4,428,775, Cl. 106-90.000.
National Semiconductor Corporation: *See*—
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Nauheimer, James F., to Container Corporation of America. Sift proof liner for outer container. 4,428,499, Cl. 220-470.000.
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Neal, James W.; Sullivan, Joseph W.; and Loersch, Joseph F., to United Technologies Corporation. Duplex peening and smoothing process. 4,428,213, Cl. 72-53.000.
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Heijenga, Berend; Hilbrink, Hubertus E.; and Klaij, Henri F., 4,428,907, Cl. 422-61.000.
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Macauley, George C.; Nemecek, William F.; and Roefer, Robert W., 4,429,306, Cl. 340-790.000.
Nemecsek, Ferenc; and Wilke, Elmar, to International Standard Electric Corporation. Circuit arrangement for detecting and interpreting interferences with automatic machines and particularly coin telephones. 4,429,183, Cl. 179-6.30R.
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Nichols, Lawrence J.; and MacMaster, George H., to Raytheon Company. Divider/combiner amplifier. 4,429,286, Cl. 330-286.000.
Nicolaou, Kyriacos C.; Magolda, Ronald L.; and Claremon, David A., to Research Corporation. Method of preparing bicyclo(3.1.1)hept-2-one. 4,429,166, Cl. 568-352.000.
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Nikly, Jean, to Automobiles M. Berliet. Direct injection diesel engine with a mechanically controlled injector. 4,428,340, Cl. 123-276.000.
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Nishizawa, Kanji; Hamada, Kazuhiko; and Aratani, Tadatoshi, to Sumitomo Chemical Company, Limited. Preparation of p-hydroxybenzaldehyde derivatives. 4,429,163, Cl. 568-432.000.

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Nitschke, Werner, to Robert Bosch GmbH. Apparatus for generating pulses upon decreases in supply voltage. 4,429,236, Cl. 307-362.000.

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Nordica S.p.A.: *See*—
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Norota, Susumu; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, to Teijin Limited. Filament-like fibers and bundles thereof, and novel process and apparatus for production thereof. 4,429,006, Cl. 428-373.000.

Norstrom, Lars A., to Uddeholms Aktiebolag. Welded steel chain. 4,428,781, Cl. 148-36.000.

Northern Telecom Limited: *See*—
Pan, Ali; and Ellwood, John R., 4,428,787, Cl. 156-54.000.

Norton Co.: *See*—
Cummings, Paul W., Jr.; and Mailhot, David J., 4,428,893, Cl. 261-122.000.
Fredriksson, John I.; Morrow, John D.; and Rossi, Giulio A., 4,429,003, Cl. 428-317.900.

Nosek, Frank J. Spray nozzle actuator. 4,428,512, Cl. 222-402.150.

Noto, Kunihiro: *See*—
Hayashibara, Toshio; Noto, Kunihiro; and Fukasaku, Yoshinori, 4,428,719, Cl. 417-354.000.

Novak, Peter, to Rieter Machine Works, Limited. Bobbin and a bobbin support structure for a roving frame. 4,428,541, Cl. 242-46.200.

Nowak, Rudolf; and Holland, Gerhard, to Halomet AG. Process for the separation of metals from a gaseous mixture formed during reduction. 4,428,771, Cl. 75-89.000.

Noyes, Billy P.: *See*—
Arnold, Orlan M.; and Noyes, Billy P., 4,428,134, Cl. 40-2.00R.

NSK-Warner K.K.: *See*—
Naitoh, Katsumi, 4,428,545, Cl. 242-107.40A.

Nussmeier, Thomas A.: *See*—
Wong, Shi-Yin; Little, Michael J.; Margerum, J. David; Nussmeier, Thomas A.; Calderone, Theodore; and Dellamano, Harry A., 4,428,380, Cl. 128-715.000.

NWL Transformers: *See*—
Seitz, James P., 4,429,347, Cl. 361-379.000.

Nyberg, Karl F. L.: *See*—
Holm, Per I.; Nyberg, Karl F. L.; and Sodermark, Ulf A., 4,429,184, Cl. 179-18.0EE.

Nyeki nee Kuprina, Olga: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.

Oakland Corporation, The: *See*—
Wallace, Richard B., 4,428,981, Cl. 427-195.000.
Wallace, Richard B., 4,428,982, Cl. 427-202.000.

Oakley, Charles B.; and Dischert, Robert A., to RCA Corporation. Compatible television system with increased vertical resolution. 4,429,327, Cl. 358-12.000.

Oberholzer, David J., to Western Electric Co., Inc. Methods of trimming film resistors. 4,429,298, Cl. 338-195.000.

Obey, Richard P. Coffee cup travel lid. 4,428,498, Cl. 220-367.000.

O'Brian, Rodney W.: *See*—
Armstrong, Michael P.; O'Brian, Rodney W.; and Gilliver, Stanley, 4,428,832, Cl. 209-350.000.

O'Brien, John V.: *See*—
Ryan, James M.; and O'Brien, John V., 4,428,759, Cl. 62-17.000.

Occidental Research Corporation: *See*—
Dines, Martin B.; and DiGiacomo, Peter M., 4,429,111, Cl. 528-395.000.

Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Photographic element. 4,429,039, Cl. 430-534.000.

O'Connor, George L.: *See*—
Dombek, Bernard D.; and O'Connor, George L., 4,429,057, Cl. 518-710.000.

Odogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Proportional solenoid. 4,428,558, Cl. 251-65.000.

Oelke, Erwin S., to Smith International, Inc. Radial belleville seal with encapsulated resilient core member. 4,428,588, Cl. 277-83.000.

Oeser, Heinz-Guenter: *See*—
Hickmann, Eckhard; and Oeser, Heinz-Guenter, 4,429,130, Cl. 546-167.000.

Offutt, Carl R.: *See*—
McGuire, Howard R.; and Offutt, Carl R., 4,429,204, Cl. 219-10.55F.

Ogata, Norio: *See*—
Nakagawa, Takashi; and Ogata, Norio, 4,429,083, Cl. 525-439.000.

Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,429,017, Cl. 428-463.000.

Ogawa, Junkichi: *See*—
Kato, Eiichi; Ohki, Nobutaka; and Ogawa, Junkichi, 4,429,035, Cl. 430-402.000.

Ogawa, Kimio, to Victor Company of Japan, Limited. Storage case for a cassette. 4,428,482, Cl. 206-387.000.

Ogishima, Tetsuo: *See*—
Yamagata, Tetsuo; Sato, Morio; Ogishima, Tetsuo; and Matsuyama, Yoji, 4,428,227, Cl. 73-115.000.

Oguchi, Koichi: *See*—
Hosokawa, Minoru; Oguchi, Koichi; and Yazawa, Satoru, 4,429,305, Cl. 340-784.000.

Oguri, Katsuhiko; and Sato, Kazuhiro, to Victor Company of Japan, Limited. Device for controlling tone arm carrying moving coil type pickup. 4,429,379, Cl. 369-220.000.

Oh, Shin M., to International Telephone and Telegraph Corporation. Oxyhydrogen flame torch for optical fiber drawing. 4,428,760, Cl. 65-2.000.

Ohara, Takezi; and Kodama, Yasuhisa, to Ryobi Ltd. Radio noise suppression device for a commutator motor. 4,429,241, Cl. 310-51.000.

Ohki, Nobutaka: *See*—
Kato, Eiichi; Ohki, Nobutaka; and Ogawa, Junkichi, 4,429,035, Cl. 430-402.000.
Tsubota, Motohiko; Morigaki, Masakazu; Hamaoka, Tsutomu; and Ohki, Nobutaka, 4,429,031, Cl. 430-218.000.

Ohkubo, Hiroyuki: *See*—
Narimatsu, Akihisa; and Ohkubo, Hiroyuki, 4,429,276, Cl. 324-207.000.

Ohno, Hirotoshi, to Victor Company of Japan, Limited. Apparatus for controlling the tension of a cassette tape. 4,429,261, Cl. 318-6.000.

Ohno, John M., to General Electric Company. Process for the production of silicone carbide composite. 4,428,755, Cl. 51-307.000.

Ohori, Tamio: *See*—
Umezawa, Michio; Naruse, Osamu; Furukawa, Tatsuya; Ohori, Tamio; Furukawa, Isokazu; and Kakeno, Sadao, 4,429,317, Cl. 346-75.000.

Ohta, Kiyonari: *See*—
Mishiba, Saburo; Ohta, Kiyonari; Fujieda, Kazumasa; Matsumoto, Kojiro; and Uchida, Akira, 4,429,074, Cl. 524-819.000.

Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Method of electrically contacting recording medium. 4,429,323, Cl. 346-153.100.

Okabe, Takahiro: *See*—
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.

Okada, Yutaka: *See*—
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.

Okado, Hiroyuki: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,429,198, Cl. 200-144.00R.

Okazaki, Masaki: *See*—
Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, 4,429,050, Cl. 436-538.000.

Okita, Tsutomu; Naruo, Kyoichi; and Ushimaru, Akira, to Fuji Photo Film Co., Ltd. Process for producing magnetic recording material. 4,428,974, Cl. 427-44.000.

O'Klatner, Charles L.: *See*—
Harper, James R.; and O'Klatner, Charles L., 4,428,288, Cl. 101-248.000.

Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Catalyst composition for use in production of high lubricating oil stock. 4,428,865, Cl. 502-77.000.

Olin Corporation: *See*—
Breedis, John F.; and Fister, Julius C., 4,429,022, Cl. 428-675.000.
Grynkewich, Gregory W., 4,428,915, Cl. 423-312.000.
Urs, Venkataramaraj S., 4,428,295, Cl. 102-448.000.

Oliphant, Stephen E., to Stability Drilling Systems, Inc. Shock absorbing tool for connection to a drill column. 4,428,443, Cl. 175-321.000.

Oliver, Emerson T.; Doyle, Brian P.; and Marriner, Philip R. Reinforced opening. 4,428,317, Cl. 114-114.000.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Sliding sleeve for clutch throw-out. 4,428,472, Cl. 192-98.000.
Olsen, Gregory H.; and Zamerowski, Thomas J., to RCA Corporation. Semiconductor laser. 4,429,395, Cl. 372-45.000.
Olson, Donald H.: *See*—
Glass, Alastair M.; Kaminow, Ivan P.; and Olson, Donald H., 4,428,644, Cl. 350-96.140.
Olsson, Billy E.: *See*—
Kam, Lit-Yam; and Olsson, Billy E., 4,428,636, Cl. 339-97.00P.
Oltarzewski, Edward S.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,428,869, Cl. 252-522.00A.
Olympus Optical Co., Ltd.: *See*—
Shirako, Hideo; and Saito, Shoichi, 4,428,479, Cl. 206-387.000.
OMI International Corporation: *See*—
Rymwid, Yvonne; and Baker, Kenneth, 4,428,804, Cl. 204-46.00R.
Verberne, Wim M. J. C.; and Eggels, Adriana G. M., 4,428,803, Cl. 204-43.00Z.
Omori, Norio: *See*—
Suzuki, Atsushi; Omori, Norio; Ninomiya, Masakazu; Akiyama, Susumu; and Hirabayashi, Yuji, 4,428,342, Cl. 123-419.000.
Omure, Yukio: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Omure, Yukio, 4,428,851, Cl. 252-58.000.
Ono, Kimizo: *See*—
Yoshida, Kenichi; Ono, Kimizo; Sunago, Katsuyoshi; Takenaka, Shinya; and Iwai, Tohru, 4,429,392, Cl. 372-9.000.
Ono, Shinji: *See*—
Kohyama, Katsuhisa; Sakata, Katsuyuki; and Ono, Shinji, 4,429,103, Cl. 528-176.000.
Oplt, David W.; and Peil, Fred G., to Lukens General Industries, Inc. Reflective paving marker. 4,428,320, Cl. 116-63.00R.
Ormat Turbines, Ltd.: *See*—
Bronicki, Lucien Y., 4,428,190, Cl. 60-655.000.
Ormond, Robert E.: *See*—
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,429,042, Cl. 435-119.000.
Osako, Kyoichi, to Laurel Bank Machine Co., Ltd. Paper sheet dispenser. 4,428,501, Cl. 221-13.000.
Oshiage, Katsunori: *See*—
Takase, Sadao; Yamamoto, Akito; Oshiage, Katsunori; and Hosaka, Akio, 4,428,348, Cl. 123-480.000.
Oskar, Ramnesten I., to Forenade Fabriksverken. Method and tool for the cold forging of internally profiled tubes. 4,428,220, Cl. 72-370.000.
Oster, Richard J.: *See*—
Brouckson, Robert H.; Martin, George; and Oster, Richard J., 4,428,248, Cl. 74-335.000.
Ota, Hiroshi: *See*—
Taki, Hiroyuki; Mizuguchi, Hidenori; and Ota, Hiroshi, 4,428,621, Cl. 303-13.000.
Otavsky, Pavel: *See*—
Berube, Normand A.; Otavsky, Pavel; Hinlein, Sigmund; and Wiseley, Thomas, 4,429,336, Cl. 360-97.000.
Otis Engineering Corporation: *See*—
Yonker, John H.; and Fisher, Ernest P., Jr., 4,428,557, Cl. 251-62.000.
Otsuka Kagaku Yakuhin Kabushini Kaisha: *See*—
Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, 4,429,164, Cl. 568-377.000.
Ott, Clarence R., Jr.: *See*—
Getz, Edward H.; and Ott, Clarence R., Jr., 4,428,088, Cl. 8-158.000.
Overell, Brain G., to Beecham Group Limited. Pharmaceutical compositions. 4,428,932, Cl. 424-91.000.
Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S.; and Higginbotham, James M., Sr., 4,428,524, Cl. 228-170.000.
Owens, Roland G. Transfer apparatus for straight side press. 4,428,221, Cl. 72-405.000.
Oy Fiskars AB: *See*—
Mayer, Paul C., 4,428,515, Cl. 224-232.000.
Oy Tampella AB: *See*—
Maijala, Ari A. M.; and Aario, Matti I., 4,428,534, Cl. 241-18.000.
Ozutsumi, Shunichi; and Yamamoto, Osamu, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Process for producing foamable polyolefin particles. 4,429,059, Cl. 521-60.000.
Pabley, Avtar S., to Smith International, Incorporated. Method for stimulating siliceous subterranean formations. 4,428,432, Cl. 166-302.000.
Padrnos, Dennis R.: *See*—
Dickinson, Robert J., 4,428,144, Cl. 43-44.960.
Page, Ronald W., to National Semiconductor Corporation. Multistage cascade/cascode limiting IF amplifier and meter circuit. 4,429,416, Cl. 455-211.000.
Pako Corporation: *See*—
Henk, Keith L., 4,428,249, Cl. 74-412.0TA.
Pallant, Joseph, to H. R. Turner (Willenhall) Limited. Adjustment mechanism. 4,428,553, Cl. 248-157.000.
Pallosy nee Becker, Katalin: *See*—
Pasztor, Emil; Lazar, Laszlo; Nagy, Jozsef; and Pallosy nee Becker, Katalin, 4,429,062, Cl. 523-118.000.
Paluka, Charles F.: *See*—
Moore, M. Samuel; and Paluka, Charles F., 4,428,199, Cl. 60-600.000.
Pan, Ali; and Ellwood, John R., to Northern Telecom Limited. Wrapping of cable core units. 4,428,787, Cl. 156-54.000.
Panek, Edward J.; and Davis, Pauls, to BASF Wyandotte Corporation. Polyether thickeners for aqueous systems containing additives for increased thickening efficiency. 4,428,860, Cl. 252-315.100.
Panoch, Hans J.: *See*—
Mumcu, Salih; and Panoch, Hans J., 4,429,081, Cl. 525-420.000.
Papahadjopoulos, Demetrios P.: *See*—
Martin, Frank J.; Papahadjopoulos, Demetrios P.; and Hubbell, Wayne L., 4,429,008, Cl. 428-402.200.
Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the manufacture of 2(3H)-benzothiazolones substituted in 3-position. 4,429,134, Cl. 548-165.000.
Papp International Incorporated: *See*—
Papp, Joseph, 4,428,193, Cl. 60-509.000.
Papp, Joseph, to Papp International Incorporated. Inert gas fuel, fuel preparation apparatus and system for extracting useful work from the fuel. 4,428,193, Cl. 60-509.000.
Papst Motoren GmbH & Co., KG: *See*—
Muller, Siegfried; and Wrobel, Gunter, 4,429,245, Cl. 310-261.000.
Papst-Motoren KG: *See*—
Muller, Rolf, 4,429,263, Cl. 318-254.000.
Parg, Adolf: *See*—
Hamprecht, Gerhard; Parg, Adolf; and Wuerzer, Bruno, 4,428,766, Cl. 71-91.000.
Pargee, Robert W., Jr., to EECO Incorporated. Television compressed audio. 4,429,332, Cl. 358-143.000.
Park, Jae M.: *See*—
Bell, James P.; and Park, Jae M., 4,428,987, Cl. 427-327.000.
Parker, Donald L.; and Warwick, Edward H., to General Motors Corporation. Clutch operator with a hydraulic actuator. 4,428,471, Cl. 192-85.00C.
Parker, Donald L.: *See*—
Warwick, Edward H.; and Parker, Donald L., 4,428,462, Cl. 188-72.400.
Warwick, Edward H.; and Parker, Donald L., 4,428,620, Cl. 303-3.000.
Parker, Russell A.: *See*—
Rogers, Calvin; Parker, Russell A.; and Loucks, Terry L., 4,429,049, Cl. 436-178.000.
Parnham, Ray G.: *See*—
Willemsen, Bernardus A.; and Parnham, Ray G., 4,428,160, Cl. 51-129.000.
Parsons, Albert; and Havens, H. Norris, to Consolidated Systems, Inc. Universal concrete screed system. 4,428,556, Cl. 249-3.000.
Parsons Manufacturing, Incorporated: *See*—
Moser, Robert, 4,428,304, Cl. 108-65.000.
Parsons, William D. Variable cylinder operation of internal combustion engine. 4,428,337, Cl. 123-198.00F.
Pasmannik, Vitaly I.; Mironenko, Ljudmila A.; and Nazarov, Sergei N. Klystron. 4,429,255, Cl. 315-5.390.
Pasquine, Anthony. Variable dice game device. 4,428,580, Cl. 273-145.00C.
Passarotti, Carlo: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,428,952, Cl. 424-251.000.
Pastor, Antonio C.: *See*—
Pastor, Ricardo C.; Gorre, Luisa E.; Pastor, Antonio C.; and Chew, Remedios K., 4,429,009, Cl. 428-410.000.
Pastor, Ricardo C.; Gorre, Luisa E.; Pastor, Antonio C.; and Chew, Remedios K., to Hughes Aircraft Company. Process for surface conversion of vitreous silica to cristobalite. 4,429,009, Cl. 428-410.000.
Pasztor, Emil; Lazar, Laszlo; Nagy, Jozsef; and Pallosy nee Becker, Katalin. Pharmaceutically acceptable silicon rubber and therapeutical set and the use thereof for surgical embolization. 4,429,062, Cl. 523-118.000.
Paton, Robert, to Biorganic Energy Inc. Anaerobic digestion of organic waste for biogas production. 4,429,043, Cl. 435-167.000.
Patricia, John; and Szostak, Jan, to Singer Company, The. Feed system for a sewing machine. 4,428,316, Cl. 112-323.000.
Paulson, Rollie W. Straight line tracking turntable. 4,429,381, Cl. 369-266.000.
Pauze, Denis R.; and Hughes, Raymond B., to General Electric Company. Polyetherimide compositions and processes for production. 4,429,073, Cl. 524-600.000.
Pearlstein, Robert S., to Felt Products Mfg. Co. Gasket assembly having improved sealing characteristics and method of making same. 4,428,593, Cl. 277-235.00B.
Peck, Paul L., to Total Shooting Systems, Inc. Tree stand. 4,428,459, Cl. 182-187.000.
Peckham, Arthur C.; Faste, Rolf A.; and Peckham, Arthur C., Jr., to Peckham, Arthur C. Corrective and protective knee brace. 4,428,369, Cl. 128-80.00C.
Peckham, Arthur C., Jr.: *See*—
Peckham, Arthur C.; Faste, Rolf A.; and Peckham, Arthur C., Jr., 4,428,369, Cl. 128-80.00C.
Pedretti, Ugo; Lugli, Gabriele; Poggio, Sergio; and Mazzei, Alessandro, to Anic, S.p.A. Polymerizing and copolymerizing diolefines, and means therefor. 4,429,089, Cl. 526-153.000.
Peeples, Walter P., Jr.: *See*—
Acree, Elick H.; and Peeples, Walter P., Jr., 4,428,108, Cl. 29-455.00R.

Peffer, John R.: *See—*
Lee, Kyu-Wang; Peffer, John R.; Piccirilli, Robert; and Chang, Wen-Hsuan, 4,429,082, Cl. 525-426.000.

Peil, Fred G.: *See—*
Oplt, David W.; and Peil, Fred G., 4,428,320, Cl. 116-63.00R.

Peloza, Kirk B., to Eaton Corporation. Viscous link drive for fluid flowmeter. 4,428,231, Cl. 73-202.000.

Penda Corporation: *See—*
Dresen, William L.; Price, William F.; and Breezer, Harlan W., 4,428,306, Cl. 108-53.300.

Penn Fishing Tackle Mfg. Co.: *See—*
Henze, Walter J.; and Purcell, William, 4,428,139, Cl. 43-20.000.

Penn, Howard J., to Morton Thiokol, Inc. Adhesive for solar control film. 4,429,005, Cl. 428-350.000.

Pennsylvania Engineering Corporation: *See—*
Nagati, Rashed N., 4,428,564, Cl. 266-246.000.

Penschuck, Jurgen: *See—*
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.

Pentaflex, Inc.: *See—*
McGregor, John C., Jr., 4,428,688, Cl. 384-208.000.

Pentapharm A.G.: *See—*
Svendsen, Lars G., 4,428,874, Cl. 260-112.50R.

Peristein, Jerome H.; Reynolds, George A.; VanAllan, James A.; and Clark, Suzanne P., to Eastman Kodak Company. Photoconductive compositions. 4,429,030, Cl. 430-75.000.

Perotto, Riccardo, to Nordica S.p.A. Inner boot structure particularly for ski boots. 4,428,130, Cl. 36-117.000.

Persson, Goran; and Johnson, Lars, to Goran Persson Maskin AB. Method and apparatus for mixing liquid and paste-like substances. 4,428,680, Cl. 366-296.000.

Pesold, Erwin: *See—*
Gau, George; and Pesold, Erwin, 4,428,474, Cl. 198-394.000.

Peters, Alan R., to Automation International Corp. De-packaging apparatus. 4,428,709, Cl. 414-412.000.

Peters, Manfred: *See—*
Boie, Immo; Peters, Manfred; and Kaluschke, Thomas, 4,429,033, Cl. 430-237.000.

Peterson, Marvin A., to General Electric Company. Composition, process of coating, and substrate. 4,428,977, Cl. 427-120.000.

Peterson, Thomas E.: *See—*
DiBiancs, Frank A.; Pritzkow, Dennis H.; and Peterson, Thomas E., 4,429,227, Cl. 250-367.000.

Petzl, Paul; and Petzl, Pierre, to Etablissements Petzel. Electric lamp with a single device for focus-control and switch-control. 4,429,351, Cl. 362-187.000.

Petzl, Pierre: *See—*
Petzl, Paul; and Petzl, Pierre, 4,429,351, Cl. 362-187.000.

Peyman, Gholam A.; Raichand, Notilal; and Murray, Edward J. Combined ultrasonic emulsifier and mechanical cutter for surgery. 4,428,748, Cl. 604-22.000.

Pfeifer, Josef, to Ciba-Geigy Corporation. Transparent polyamide from branched chain arylalkyl diamine. 4,429,110, Cl. 528-348.000.

Pfister, Gustav: *See—*
Wagli, Peter; Zetting, Alois; and Pfister, Gustav, 4,429,224, Cl. 250-342.000.

Pfizer Inc.: *See—*
Myers, Robert F., 4,428,935, Cl. 424-114.000.
Nagel, Arthur A., 4,429,116, Cl. 536-7.200.
Rosati, Robert L., 4,429,128, Cl. 544-373.000.

Phan, Trung H.: *See—*
Cognard, Jacques; Phan, Trung H.; and Markert, Jurgen, 4,428,858, Cl. 252-299.100.

Phelps, Russell L.; Stemmle, Denis J.; and Minerd, Timothy M., to Xerox Corporation. Document deskewing system. 4,428,666, Cl. 355-14.0SH.

Phelps, Russell L.; Sisson, Jeffrey L.; and Liechty, Karl E., to Xerox Corporation. Document deskewing system. 4,428,667, Cl. 355-3.0SH.

Phillips, D. Colin; Emmerich, Werner S.; Isenberg, Arnold O.; and Down, Michael G., to Westinghouse Electric Corp. System for the production of ketene and methylene from limestone utilizing a solid electrolyte electrolysis cell. 4,428,905, Cl. 376-323.000.

Phillips Petroleum Company: *See—*
Capshew, Charles E., 4,429,087, Cl. 526-119.000.
Hutson, Thomas, Jr.; and Hann, Paul D., 4,429,173, Cl. 585-331.000.

Piccirilli, Daniel M.; and Piccirilli, David M. Method for forming a grout composition. 4,429,084, Cl. 526-88.000.

Piccirilli, David M.: *See—*
Piccirilli, Daniel M.; and Piccirilli, David M., 4,429,084, Cl. 526-88.000.

Piccirilli, Robert: *See—*
Lee, Kyu-Wang; Peffer, John R.; Piccirilli, Robert; and Chang, Wen-Hsuan, 4,429,082, Cl. 525-426.000.

Pieper, Rolf: *See—*
Meffert, Harald; and Pieper, Rolf, 4,429,294, Cl. 336-198.000.

Pierce, June: *See—*
Pierce, Larry L.; and Pierce, June, 4,429,412, Cl. 378-165.000.

Pierce, Larry L.; and Pierce, June. X-Ray film marker. 4,429,412, Cl. 378-165.000.

Pierrel S.p.A.: *See—*
Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, 4,429,115, Cl. 536-7.200.

Pietryk, Erwin; Fischer, Peter; and Rauthmann, Axel, to Ford Motor Company. Windshield wiper shaft bushing assembly with washer jet. 4,428,533, Cl. 239-284.00R.

Pippert, Aaron J.; and Miser, H. T., to Utex Industries, Inc. Anti-extrusion sealing device with hinge-like bridge section. 4,428,590, Cl. 277-188.00A.

Pircher, Christian; and Schoeps, Jurgen, to Siemens AG. Three-pole cable connecting unit for a three-pole metal-encapsulated, high-voltage switching installation. 4,429,199, Cl. 200-148.00R.

Pitney Bowes Inc.: *See—*
Denison, Philibert E., III; and Branecky, George, 4,428,573, Cl. 271-305.000.

Pitt, Geoffrey J.: *See—*
Jury, Anthony W.; and Pitt, Geoffrey J., 4,429,410, Cl. 378-53.000.

Pittman, Robert B., to Industrial Electronic Hardware. Protective means for multiple pin connectors. 4,428,640, Cl. 339-176.00M.

Piwonka, Fridolin: *See—*
Hassler, Albin; and Piwonka, Fridolin, 4,428,341, Cl. 123-350.000.

Pizzolato, Giacomo: *See—*
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,428,963, Cl. 424-275.000.

Plabst, Dieter: *See—*
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Plastic Reel Corporation of America: *See—*
Basili, Robert A., 4,428,481, Cl. 206-387.000.

Pleibel, William: *See—*
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Plewes, John T.; and Tomb, Robert W., to Bell Telephone Laboratories, Incorporated. High-strength, high-conductivity copper alloys. 4,428,779, Cl. 148-12.70C.

Poggio, Sergio: *See—*
Pedretti, Ugo; Lugli, Gabriele; Poggio, Sergio; and Mazzei, Alessandro, 4,429,089, Cl. 526-153.000.

Polaroid Corporation: *See—*
Bruder, Alan H., 4,429,026, Cl. 429-152.000.
Cournoyer, Richard L.; and Foley, James W., 4,429,142, Cl. 549-394.000.
Dietz, Milton S., 4,428,654, Cl. 354-413.000.
Douglas, Lawrence M., 4,429,037, Cl. 430-499.000.
Shulman, Joseph, 4,428,997, Cl. 428-202.000.

Ponsford, Roger J., to Beecham Group Limited. Therapeutic compounds containing β-lactams. 4,428,958, Cl. 424-272.000.

Ponsford, Roger J.: *See—*
Southgate, Robert; Smale, Terence C.; and Ponsford, Roger J., 4,428,961, Cl. 424-274.000.

Porter, Christopher H.: *See—*
Lee, Kyu H.; and Porter, Christopher H., 4,428,403, Cl. 138-130.000.

Porter, James E.: *See—*
Landry, Darrell J.; and Porter, James E., 4,428,431, Cl. 166-298.000.

Potkay, Eugene: *See—*
Andrejco, Matthew J.; and Potkay, Eugene, 4,428,762, Cl. 65-3.120.

Povh, Dusan: *See—*
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,429,338, Cl. 361-42.000.

Powell, Walter W.; and Seifert, Gary A., to Western Electric Co., Inc. Vacuum-type article holder and methods of supportively retaining articles. 4,428,815, Cl. 204-297.00W.

PPG Industries, Inc.: *See—*
Lee, Kyu-Wang; Peffer, John R.; Piccirilli, Robert; and Chang, Wen-Hsuan, 4,429,082, Cl. 525-426.000.
Stermole, David A.; Loehr, Clifford E.; and Chun, Duk S., 4,428,919, Cl. 423-474.000.

Prather, Richard A.: *See—*
Lowenkron, Steven B.; Prather, Richard A.; and Steele, Howard R., 4,428,897, Cl. 264-109.000.

Precision Fukuhara Works, Ltd.: *See—*
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Prentice, Thomas C.: *See—*
Cairns, James A.; Lane, Edward S.; Prentice, Thomas C.; Segal, David L.; and Sammon, David C., 4,428,864, Cl. 502-151.000.

Price, Edison A., to Edison Price, Incorporated. Conduit connectors for lighting systems. 4,428,696, Cl. 403-168.000.

Price, William F.: *See—*
Dresen, William L.; Price, William F.; and Breezer, Harlan W., 4,428,306, Cl. 108-53.300.

Prideaux, Daniel L.; and Spencer, Robert M., to Acurex Solar Corporation. Solar tracking apparatus utilizing photovoltaic flat panels and method. 4,429,178, Cl. 136-246.000.

Pridgen, Lendon N.: *See—*
Miller, George A.; and Pridgen, Lendon N., 4,428,948, Cl. 424-244.000.

Prins, Nicolaas: *See—*
van Staveren, Hendrikus C.; and Prins, Nicolaas, 4,428,181, Cl. 56-13.600.

Pritzkow, Dennis H.: *See—*
DiBianca, Frank A.; Pritzkow, Dennis H.; and Peterson, Thomas E., 4,429,227, Cl. 250-367.000.

Prockop, Darwin J. Collagen inhibiting compositions and processes for manufacturing and using same. 4,428,939, Cl. 424-177.000.

Procter & Gamble Company, The: *See—*
Callicott, Robert H., 4,428,872, Cl. 252-550.000.

Prodeco,Inc.: *See*—
Worthington, Ralph E.; and Magdics, Alex, 4,428,910, Cl. 423-10.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Bertrand, Jean; and Gaillard, Michel, 4,429,098, Cl. 528-59.000.
Proffer, Charles L. Latchset and strike assembly for doors. 4,428,606, Cl. 292-181.000.
Protection, Inc.: *See*—
Jones, Leon; and Wilcox, Orland W., 4,428,392, Cl. 137-102.000.
Proter S.p.A.: *See*—
De Barbieri, Augusto, 4,428,875, Cl. 260-112.50R.
Public Service Company of New Mexico: *See*—
Reynolds, James E.; and Williams, Alan R., 4,428,912, Cl. 423-132.000.
Puchalski, Chester: *See*—
Bristol, James A.; and Puchalski, Chester, 4,428,962, Cl. 424-274.000.
Punja, Nazim, to Imperial Chemical Industries PLC. Halogenated esters. 4,429,153, Cl. 562-493.000.
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Putt, Mark S.: *See*—
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Quadra Wheelchairs, Inc.: *See*—
Minnebraker, Jeffrey P., 4,428,594, Cl. 280-242.0WC.
Quaker Oats Company, The: *See*—
Stern, Carl M.; Maher, William M.; and Ventre, Michael T., 4,428,148, Cl. 46-40.000.
Queen's University of Kingston: *See*—
Morales, Alvaro, 4,428,385, Cl. 128-774.000.
Qume Corporation: *See*—
Jamieson, John W., 4,428,695, Cl. 400-249.000.
Qurnell, Frank D.: *See*—
Kasik, James E.; Qurnell, Frank D.; and Dennison, David K., 4,428,903, Cl. 376-261.000.
R. A. Stearn, Inc.: *See*—
Bassett, Noel L.; and King, Henry R., 4,428,504, Cl. 222-55.000.
R. J. Reynolds Tobacco Company: *See*—
Deal, Philip A., 4,428,742, Cl. 493-142.000.
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Larsson, Olof, 4,428,172, Cl. 52-489.000.
R. P. Scherer Corporation: *See*—
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Racal Data Communications Inc.: *See*—
Greenstein, Larry; and Marshall, Michael B., 4,429,382, Cl. 370-80.000.
Ragen, Robert A., to Xerox Corporation. Rotary printing device with identifying means and method and apparatus for in situ identification. 4,428,694, Cl. 400-144.200.
Raible, Donald A., to Bentley Laboratories, Inc. Method for oxygenating blood. 4,428,934, Cl. 424-101.000.
Raichand, Notilal: *See*—
Peyman, Gholam A.; Raichand, Notilal; and Murray, Edward J., 4,428,748, Cl. 604-22.000.
Raitto, Russell G., to Concord Laboratories, Inc. Method and apparatus for collecting urine. 4,428,384, Cl. 128-760.000.
Ramer, James L. Electromagnetic microwave dielectric heated steam flash plug. 4,429,203, Cl. 219-10.55A.
Ramesohl, Hubert: *See*—
Deussner, Herbert; Herchenbach, Horst; Ramesohl, Hubert; and Breidenstein, Wolfgang, 4,428,727, Cl. 431-182.000.
Ramet, Claude; and Rojey, Alexandre, to Institut Francais du Petrole. Process for the heating and/or thermal conditioning of a building by means of a heat pump operated with a specific mixture of working fluids. 4,428,853, Cl. 252-67.000.
Ramnesten, Ivan O., to Forenade Fabriksverken. Cold forging mandrel with threads. 4,428,222, Cl. 72-479.000.
Ramsey Engineering Company: *See*—
Berry, Peter F.; Miller, Wendell D.; and Nethery, John L., Jr., 4,429,409, Cl. 378-45.000.
Rankin, E. Edward, to H-G Testing Company. Wireline winch mounting system. 4,428,421, Cl. 166-77.000.
Rao, Velliyur Nott M., to Du Pont de Nemours, E. I., and Company. Oxidation catalyst. 4,429,055, Cl. 502-202.000.
Rapsomanikis, Nikolas: *See*—
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Ratliff, Richard L., to Don Lee Supply, Inc. Steam boiler heat recovery apparatus. 4,428,328, Cl. 122-396.000.
Rattay, M. Joan: *See*—
Rattay, Rosemary C.; and Rattay, M. Joan, 4,428,484, Cl. 206-548.000.
Rattay, Rosemary C.; and Rattay, M. Joan. Portable wine bottle carrier. 4,428,484, Cl. 206-548.000.
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Rawlins, Patrick R., to Hubdean Limited. Anti-graffiti facing of walls or similar surfaces. 4,428,994, Cl. 428-164.000.
Rayborn, Jerry R.: *See*—
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,428,843, Cl. 252-8.50C.
Raychem Corporation: *See*—
Brigham, Alan, 4,429,216, Cl. 219-528.000.
Campbell, Bruce D.; and Triplett, James T., 4,428,115, Cl. 29-873.000.
Diaz, Stephen H., 4,428,790, Cl. 156-86.000.
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RCA Corporation: *See*—
Bendell, Sidney L., 4,429,258, Cl. 315-382.000.
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Chang, Kern K. N., 4,429,254, Cl. 315-3.000.
Chin, Danny; Henderson, John G. N.; and Maturo, Robert J., 4,429,415, Cl. 455-164.000.
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Gange, Robert A., 4,429,251, Cl. 313-411.000.
Haferl, Peter E., 4,429,257, Cl. 315-371.000.
Jastrzebski, Lubomir L.; and Lagowski, Jacek, 4,429,047, Cl. 436-4.000.
Kim, Jin K., 4,428,110, Cl. 29-572.000.
Kipp, Ronald W., 4,429,309, Cl. 343-7.0PL.
Kuzminski, Henry W., 4,429,028, Cl. 430-5.000.
Luz, David W., 4,429,259, Cl. 315-408.000.
McGlashan, Kenneth W., 4,429,293, Cl. 335-211.000.
Oakley, Charles B.; and Dischert, Robert A., 4,429,327, Cl. 358-12.000.
Olsen, Gregory H.; and Zamerowski, Thomas J., 4,429,395, Cl. 372-45.000.
Saeki, Tomoki, 4,429,376, Cl. 369-43.000.
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Reay, Alan, to Fletcher Industries Limited, The. Ventilating means. 4,428,167, Cl. 52-72.000.
Redd, Bobby G.: *See*—
Smyrl, Kenneth E.; and Redd, Bobby G., 4,428,428, Cl. 166-278.000.
Redington, Gordon. Range indicating device. 4,428,668, Cl. 356-17.000.
Reece, Alan R., to British Petroleum Company p.l.c., The. Trenching plow with plow carriage on curved supporting track. 4,428,132, Cl. 37-193.000.
Rees, Karl, to Sulzer Brothers Ltd. Steam generator support structure. 4,428,329, Cl. 122-510.000.
Reetz, Manfred T.; and Chatziiosifidis, Ioannis, to Bayer Aktiengesellschaft. Preparation of trimethylsilyl cyanide. 4,429,145, Cl. 556-415.000.
Reich, Karl, to W. R. Grace & Co. Anaerobically curable sealant and adhesive composition. 4,429,063, Cl. 523-176.000.
Reichenberg, John F.: *See*—
Benin, Joshua; Mulholland, Kenneth L.; and Reichenberg, John F., 4,428,539, Cl. 242-18.00A.
Reichl, Helmut; Hartl, Richard; and Newinger, Christoph, to Siemens Aktiengesellschaft. Device for tensioning a data carrier which is moved by feed tractors. 4,428,519, Cl. 226-75.000.
Reifschneider, Walter, to Dow Chemical Co., The. Phosphorus esters of 5-pyrimidinols. 4,429,125, Cl. 544-243.000.
Reinke, Fritz, to Fritz Reinke Engineering. Process and apparatus for producing composite building panels, and panels produced thereby. 4,428,791, Cl. 156-161.000.
Reinsma, Harold L., to Caterpillar Tractor Co. Dual operating mode seal assembly. 4,428,589, Cl. 277-101.000.
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Reiter, Udo; and Lehmann, Helmut, to BASF Aktiengesellschaft. Preparation of aqueous thermosetting electrical insulating varnishes, and use of the varnishes. 4,429,072, Cl. 524-591.000.
Reliance Electric Company: *See*—
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Renaud, Ronnie C., to Universal Sewing Supply Inc. Needle guide. 4,428,314, Cl. 112-227.000.
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REPA Feinstanzwerk GmbH: *See*—
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Research and Development Institute, Inc., at Montana State University: *See*—
Goering, Kenneth J.; and Eslick, Robert F., 4,428,967, Cl. 426-28.000.
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Anderson, Burton C.; England, David C.; and Resnick, Paul R., 4,429,143, Cl. 549-450.000.
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Reynolds, James E.; and Williams, Alan R., to Public Service Company of New Mexico. Regeneration of chloridizing agent from chlorination residue. 4,428,912, Cl. 423-132.000.
Rheinische Braunkohlenwerke AG.: *See—*
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Ribbing, Wilfried: *See—*
Burzin, Klaus; Bartmann, Martin; Bax, Hanns-Jorg; and Ribbing, Wilfried, 4,429,106, Cl. 528-216.000.
Rice, Robert; and Ferreira, Robert. Y-Connection for flexible conduit. 4,428,601, Cl. 285-197.000.
Rice, William J., to United States of America, National Aeronautics and Space Administration. Real time pressure signal system for a rotary engine. 4,428,226, Cl. 73-115.000.
Rich, Donald S., to Thomas & Betts Corporation. Coaxial cable transition connector. 4,428,632, Cl. 339-17.00C.
Rich, Lesley S.; and Skurka, Richard, to Rich, Lesley S. Multi position sheet guide. 4,428,521, Cl. 226-199.000.
Richardson, Edwin A.: *See—*
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Richmond, Moscow K. System and method for the automatic control of electrically operated gates. 4,429,264, Cl. 318-466.000.
Richmond, Raymond. Tensioning apparatus. 4,428,099, Cl. 24-68.0CD.
Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Darko, Laszlo L.; Nakanishi, Koji; and Nakagawa, Masachi, 4,429,141, Cl. 549-382.000.
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Ricoh Company, Ltd.: *See—*
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Riebli, Peter: *See—*
Hubele, Adolf; Riebli, Peter; Eckhardt, Wolfgang; and Kunz, Walter, 4,428,964, Cl. 424-309.000.
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Rieter Machine Works, Limited: *See—*
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Riggs, Robert A., to Halliburton Company. High temperature exploding bridge wire detonator and explosive composition. 4,428,292, Cl. 102-202.700.
Riley, Jack L.; Lock, Michael C.; and Goddin, Jeremy R., to Yorkshire Imperial Plastics Limited. Method of forming a pipe of oriented thermoplastics polymeric material. 4,428,900, Cl. 264-526.000.
Riley, James E., to Wessel Company, Inc., The. Reply card arrangement with confidentiality flap. 4,428,526, Cl. 229-92.800.
Riley, John F.: *See—*
Halliday, David P.; Riley, John F.; and Sharrock, Barry, 4,428,549, Cl. 244-1.00R.
Rinehart, David M., to DISCO Aluminum Products Company, Inc. Window safety lock. 4,428,154, Cl. 49-390.000.
Ringfeder GmbH: *See—*
Stiefel, Christian; Friedrichs, Josef; Marsella, Gino; and Kahle, Horst, 4,428,565, Cl. 267-9.00A.
RIV-SKF Officine di Villar Perosa S.p.A.: *See—*
Colanzi, Franco; and Vignotto, Angelo, 4,428,629, Cl. 308-187.200.
Rivier, Jean E. F.; Vale, Wylie W., Jr.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Analogs of somatostatin. 4,428,942, Cl. 424-177.000.
Robbins, C. Wayne; and Trimmer, William S. N., to Technicare Corporation. Passive ultrasound needle probe locator. 4,428,379, Cl. 128-660.000.
Robbins, Jeffrey D., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,428,888, Cl. 260-502.50F.
Robert Bosch GmbH: *See—*
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Bertling, Hannes; and Leiber, Heinz, 4,428,623, Cl. 303-114.000.
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.
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Hassler, Albin; and Piwonka, Fridolin, 4,428,341, Cl. 123-350.000.
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Linder, Ernst; Rembold, Helmut; and Teegen, Walter, 4,428,195, Cl. 60-397.000.
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Kabat, Jules M.; and Beggs, James H., 4,429,299, Cl. 340-310.00R.
Rowley, Paul M., 4,429,296, Cl. 337-338.000.
Robertson, Ralston S., Jr.; and Eisenhart, Robert L., to Hughes Aircraft Company. Coaxially coupled tunable oscillator using a ridge waveguide. 4,429,287, Cl. 331-107.0DP.
Roby, Mark S.: *See—*
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Rockwell International Corporation: *See—*
Catterfeld, Fritz C., 4,428,717, Cl. 416-186.00R.
Hawkinson, Elden L., 4,428,998, Cl. 428-240.000.
Mai, Don L., 4,429,404, Cl. 375-76.000.
Rodgers, Jeffrey C., to British Rema Manufacturing Co., Limited. Pulverizing and classifying mill. 4,428,536, Cl. 241-52.000.
Rody, Jean: *See—*
Karrer, Friedrich; Berner, Godwin; and Rody, Jean, 4,429,077, Cl. 525-143.000.
Roefer, Robert W.: *See—*
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Roetzler, Francis J. Log splitter with a tapered wood penetrating member on the ramhead. 4,428,409, Cl. 144-193.00A.
Rogers, Calvin; Parker, Russell A.; and Loucks, Terry L., to Mead Corporation. Method for the analysis of organic pollutants. 4,429,049, Cl. 436-178.000.
Rogers, Edward S.: *See—*
Hobbs, Simon H.; Rogers, Edward S.; and Antos, George J., 4,428,827, Cl. 208-120.000.
Rohde, Earl C. Lookout convertible to a compact dolly. 4,428,456, Cl. 182-20.000.
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Gioeni, Mary L.; and Merritt, Richard F., 4,429,070, Cl. 524-517.000.
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Cox, Karmen D., 4,429,205, Cl. 219-10.770.
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Rosler, Helmut; Muhlbauer, Otto; Dempf, Josef; and Bigall, Klaus-Dieter, to Siemens Aktiengesellschaft. Digital semiconductor circuit for an electronic organ. 4,428,267, Cl. 84-1.010.
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Rostoucher, Guy: *See—*
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Hubbard, Kevin L.; and Roth, Robert R., 4,428,435, Cl. 172-328.000.
Rottmaier, Ludwig: *See—*
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,429,135, Cl. 548-264.000.
Rouge, Marianne: *See—*
Confalone, Pasquale N.; Pizzolato, Giacomo; Uskokovic, Milan R.; and Rouge, Marianne, 4,428,963, Cl. 424-275.000.
Rowe, Rodney A.: *See—*
Lane, Christopher D.; and Rowe, Rodney A., 4,428,191, Cl. 60-737.000.

Rowley, Paul M., to Robertshaw Controls Company. Thermostat construction having a one-piece V-shaped lead and method of making the same. 4,429,296, Cl. 337-338.000.

Rozmus, Walter J., to Kelsey-Hayes Company. Pressure transmitting medium and method for utilizing same to densify material. 4,428,906, Cl. 419-48.000.

Rubber Millers, Inc.: *See*—
McNatt, Robert B.; and Day, John T., 4,428,568, Cl. 267-140.000.

Rucci, Guglielmo: *See*—
Agnes, Giovanni; Rucci, Guglielmo; and Santini, Claudio, 4,429,147, Cl. 560-81.000.

Rudolph, Rome R.; Strutz, Carl; and Strutz, Frank C. Method and apparatus for silk screen printing on conical or cylindrical containers. 4,428,283, Cl. 101-35.000.

Ruell, Hartwig; Devinney, Edward J., Jr.; and Chiu, Ming-Yee, to Siemens Corporation. Fingerprint sensing device for deriving an electric signal. 4,428,670, Cl. 356-71.000.

Ruland, Frederick F., to Ruland Manufacturing Company, Inc. Device adapted for clamping to a rotatable shaft. 4,428,697, Cl. 403-344.000.

Ruland Manufacturing Company, Inc.: *See*—
Ruland, Frederick F., 4,428,697, Cl. 403-344.000.

Ruppmann, Claus: *See*—
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.

Russell Corporation: *See*—
Adamson, Fletcher D., 4,428,097, Cl. 19-0.250.

Rutchik, Walter L.: *See*—
Jaeschke, James R.; and Rutchik, Walter L., 4,429,339, Cl. 361-93.000.

Rutgerswerke Aktiengesellschaft: *See*—
Zellerhoff, Robert; Zander, Maximilian; and Kajetanczyk, Franz, 4,429,172, Cl. 585-241.000.

Ryan, James M.; and O'Brien, John V., to Koch Process Systems, Inc. Distillative separation employing bottom additives. 4,428,759, Cl. 62-17.000.

Ryman Engineering Company: *See*—
Fatula, James J., Sr., 4,428,158, Cl. 51-33.00R.

Rymwid, Yvonne; and Baker, Kenneth, to OMI International Corporation. High speed bright silver electroplating bath and process. 4,428,804, Cl. 204-46.00R.

Ryobi Ltd.: *See*—
Ohara, Takezi; and Kodama, Yasuhisa, 4,429,241, Cl. 310-51.000.

S. C. Johnson & Sons, Inc.: *See*—
Emerson, Kenneth R.; and Haworth, Diane, 4,428,509, Cl. 222-153.000.

Saari, Veikko R., to Bell Telephone Laboratories, Incorporated. Offset-nulled sample-and-hold amplifier. 4,429,282, Cl. 330-9.000.

Saat- und Erntetechnik GmbH: *See*—
Horner, Ernst L.; Knolle, Jurgen C.; and Grimm, Hans, 4,428,973, Cl. 427-3.000.

Saeki, Tomoki, to RCA Corporation. Video disc stylus deflector system. 4,429,376, Cl. 369-43.000.

Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, to Toyama Chemical Co., Ltd. Antibacterial composition for medical use. 4,428,936, Cl. 424-114.000.

Saint-Gobain Emballage: *See*—
Brax, Jean A., 4,428,686, Cl. 374-179.000.

Saito, Akira; Yamori, Akio; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic polymer composition. 4,429,076, Cl. 525-57.000.

Saito, Motoyuki; and Hatanaka, Hideo, to Citizen Watch Co., Ltd. Electrical connection construction for electronic timepiece. 4,428,683, Cl. 368-250.000.

Saito, Shoichi: *See*—
Shirako, Hideo; and Saito, Shoichi, 4,428,479, Cl. 206-387.000.

Saito, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a jacket opening enlarging device. 4,429,377, Cl. 369-77.200.

Sakagami, Teruo: *See*—
Murayama, Naohiro; Sakagami, Teruo; and Shoji, Masuhiro, 4,428,873, Cl. 252-583.000.

Sakai, Hiroshi: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.

Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Focus detecting system. 4,428,652, Cl. 354-407.000.

Sakai, Yoshio; and Yamada, Takeshi, to Totoku Electric Co., Ltd. Planar heat generator. 4,429,215, Cl. 219-528.000.

Sakamoto, Fumio; Ikeda, Shoji; Tsukamoto, Goro; and Utsumi, Isamu, to Kanebo Ltd. Process for producing brominated 1,3-dioxolen-2-ones. 4,428,806, Cl. 204-158.0HA.

Sakata, Katsuyuki: *See*—
Kohyama, Katsuhisa; Sakata, Katsuyuki; and Ono, Shinji, 4,429,103, Cl. 528-176.000.

Sakiyama, Kazutaka: *See*—
Masuda, Yoshimichi; Watanabe, Ryuzo; Imura, Shinichi; and Sakiyama, Kazutaka, 4,428,778, Cl. 148-11.50P.

Sako, Yuji: *See*—
Mori, Teijiro; Masuda, Shigeru; Okado, Hiroyuki; Kakizoe, Masahiro; and Sako, Yuji, 4,429,198, Cl. 200-144.00R.

Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, to Kabushiki Kaisha Meidensha; and Kabushiki Kaisha Gemvac. Vacuum power interrupting device. 4,429,197, Cl. 200-144.00B.

Sakurai, Kazuhiro: *See*—
Odogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,428,558, Cl. 251-65.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,429,335, Cl. 358-342.000.

Sakurai, Tokio; Komiya, Kyosuke; Mori, Yoshihiko; Kitahama, Yoshiharu; and Iwami, Isamu, to Asahi-Dow Limited. Method for manufacture of orthomethylated phenol compounds. 4,429,171, Cl. 568-804.000.

Salk Institute for Biological Studies, The: *See*—
Rivier, Jean E. F.; Vale, Wylie W., Jr.; and Brown, Marvin R., 4,428,942, Cl. 424-177.000.

Salminen, Ensio. Method and apparatus for preventing piglets from suffocating under the dam in a brooding pen. 4,428,324, Cl. 119-20.000.

Sammon, David C.: *See*—
Cairns, James A.; Lane, Edward S.; Prentice, Thomas C.; Segal, David L.; and Sammon, David C., 4,428,864, Cl. 502-151.000.

Sanchez Cordero, Sergio. Dental floss dispenser adapted to the cap of the common toothpaste. 4,428,389, Cl. 132-92.00A.

Sandberg, Glenn A.: *See*—
Lindee, Scott A.; and Sandberg, Glenn A., 4,428,263, Cl. 83-354.000.

Sanders, Ronald E.: *See*—
Murphy, Jerry C.; Sanders, Ronald E.; and Harmon, Warren S., 4,428,698, Cl. 404-17.000.

Sandford, Paul A., to Merck & Co., Inc. Clarified tamarind kernel powder. 4,429,121, Cl. 536-123.000.

Sandoz, Ltd.: *See*—
Berner, Heinz; Turnowsky, Friederike; Laber, Georg; and Hildebrandt, Johannes, 4,428,953, Cl. 424-263.000.
Littlewood, Peter S., 4,429,133, Cl. 548-159.000.

Sandri, Joseph M.; Calentine, John W.; Linder, Seymour M.; and Billioux, Yves J., to Alcolac Inc. Polymerizable compositions comprising derivatives of mono-(alkylene ureido alkyl) ureas and bis-(alkylene ureido alkyl) ureas. 4,429,095, Cl. 526-263.000.

Sangamo Weston, Inc.: *See*—
Whitman, Boyce D.; and Bates, Robert F., 4,429,344, Cl. 361-303.000.

Sano, Yasuro, to Janome Sewing Machine Co. Ltd. Pattern selecting device for sewing machines. 4,428,311, Cl. 112-158.00A.

Santini, Claudio: *See*—
Agnes, Giovanni; Rucci, Guglielmo; and Santini, Claudio, 4,429,147, Cl. 560-81.000.

Sanyo Electric Co. Ltd.: *See*—
Miyoshi, Yasushi; and Ishii, Yasuhiro, 4,428,996, Cl. 428-198.000.

Sarasin, Gedeon: *See*—
Boray, Joseph C.; Gallay, Jean J.; and Sarasin, Gedeon, 4,428,957, Cl. 424-270.000.

Sardano, Sante P., to General Motors Corporation. Valve assembly. 4,428,496, Cl. 220-300.000.

Sargent Industries, Inc.: *See*—
Choate, Bruce R., 4,428,689, Cl. 384-296.000.

Sato, Atsushi; and Tsuyuki, Hiroshi, to TDK Electronics. Ceramic capacitor. 4,429,346, Cl. 361-321.000.

Sato, Katsuharu, to Universal Pioneer Corporation. Optical pickup device for use in a video and/or audio disc player. 4,429,378, Cl. 369-110.000.

Sato, Kazuhiro: *See*—
Oguri, Katsuhiko; and Sato, Kazuhiro, 4,429,379, Cl. 369-220.000.

Sato, Morio: *See*—
Yamagata, Tetsuo; Sato, Morio; Ogishima, Tetsuo; and Matsuyama, Yoji, 4,428,227, Cl. 73-115.000.

Sato, Satoshi; Takahashi, Hiroshi; and Nakamura, Tsutomu, to Meisei Electric Co., Ltd. Preparation method for a microscopic specimen and a device therefor. 4,428,793, Cl. 156-285.000.

Sato, Tadashi; and Tanaka, Keiji, to Canon Kabushiki Kaisha. Method and device for cleaning photosensitive screen in an image forming apparatus. 4,428,664, Cl. 355-14.00R.

Sauvey, Donald R.: *See*—
Bione, Angelo A.; and Sauvey, Donald R., 4,428,269, Cl. 84-1.010.

Sawaguchi, Mutsuo: *See*—
Fumoto, Takabumi; and Sawaguchi, Mutsuo, 4,429,225, Cl. 250-353.000.

Saytech, Inc.: *See*—
Williams, David O., 4,429,069, Cl. 524-469.000.

Scarselletta, Louis, to General Motors Corporation. Detachable insert for solar absorber. 4,428,359, Cl. 126-418.000.

Schachameyer, Steven R., to Eaton Corporation. Method of preparing a beryllia substrate for subsequent autocatalytic deposition of a metallized film directly thereon. 4,428,986, Cl. 427-309.000.

Schaefer, Frederic C., to American Cyanamid Company. Quaternary amine carbamate or urea compounds based on isopropenyl-α,α-dimethylbenzyl isocyanate. 4,429,096, Cl. 526-287.000.

Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Mirror reflex camera with an electronic range finder. 4,428,653, Cl. 354-403.000.

Schalkhauser, Ulrich, to Claudius Peters AG. Feeding system for bulk materials. 4,428,473, Cl. 198-367.000.

Schedele, Helmut, to Siemens Aktiengesellschaft. Retaining plate for use in a magnet system of a relay. 4,429,292, Cl. 335-202.000.

Scheel, Russell: *See*—
Ziegenfus, Barry L.; and Scheel, Russell, 4,428,300, Cl. 104-250.000.

Schelhorn, Gerhard: *See—*
Becker, Herbert; Sunkel, Manfred; Grams, Volker; and Schelhorn, Gerhard, 4,428,250, Cl. 74-425.000.

Schering, Aktiengesellschaft: *See—*
Gries, Heinz; and Mutzel, Wolfgang, 4,429,152, Cl. 562-442.000.

Schering Corporation: *See—*
Bristol, James A.; and Puchalski, Chester, 4,428,962, Cl. 424-274.000.

Scheuchzer, Fredy; and Buhler, Fritz, to Les Fils d'Auguste Scheuchzer S.A. Railroad track relaying train. 4,428,296, Cl. 104-2.000.

Scheurecker, Werner; Felbermayer, Erich; and Nagl, Alfred, to Voest-Alpine Aktiengesellschaft. Strand guide arrangement to be used in a continuous casting plant having the form of an arc. 4,428,415, Cl. 164-448.000.

Schleppnik, Alfred A.: *See—*
Tou, Jacob S.; and Schleppnik, Alfred A., 4,428,887, Cl. 260-465.00D.

Schlicht, Raymond C.: *See—*
Levine, Stephen A.; Schlicht, Raymond C.; Chafetz, Harry; and Whiteman, James R., 4,428,848, Cl. 252-32.7HC.

Schnegg, Anton: *See—*
Kohl, Franz; Schnegg, Anton; and Lener, Karl, 4,428,795, Cl. 156-636.000.

Schneider, Dietrich: *See—*
Kunkel, Wolfgang; Kemnade, Jorg; and Schneider, Dietrich, 4,428,923, Cl. 423-588.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Jorgensen, Neal A., 4,428,946, Cl. 424-236.000.

Schnurle, Hans: *See—*
Bertsch, Richard; Gunther, Dieter; Horbelt, Michael; Kraus, Bernd; Penschuck, Jurgen; Ruppmann, Claus; and Schnurle, Hans, 4,428,345, Cl. 123-440.000.

Schoeps, Jurgen: *See—*
Pircher, Christian; and Schoeps, Jurgen, 4,429,199, Cl. 200-148.00R.

Schoeps, Knut C., to Atlas Copco AB. Method for determining magnitude of load in an elongated bolt having an elastically deformable head. 4,428,240, Cl. 73-761.000.

Scholl, Milton R.: *See—*
Devletian, Jack H.; Wood, William E.; Turpin, Robert B.; and Scholl, Milton R., 4,429,207, Cl. 219-73.100.

Scholz, Eugen, to Riedel-de Haen Ag. Aliphatic amine-containing Karl Fischer titration agent and method for using it. 4,429,048, Cl. 436-42.000.

Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; Schon, Franz; and Feess, Erich, 4,428,750, Cl. 8-461.000.

Schon, Istvan: *See—*
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.

Schreiter, Paul W., Jr., to Concrete Transport Mixer Co. Hopper for mixer unit of a concrete transport vehicle. 4,428,677, Cl. 366-41.000.

Schrewelius, Maud, legal representative: *See—*
Schrewelius, Nils G., deceased, 4,429,019, Cl. 428-550.000.

Schrewelius, Nils G., deceased (by Schrewelius, Maud, legal representative), to Bulten-Kanthal AB. Heat-resistant machine component. 4,429,019, Cl. 428-550.000.

Schuch, Gerhard: *See—*
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,429,338, Cl. 361-42.000.

Schukoff, Bruno: *See—*
Skatsche, Othmar; Feichtinger, Gerhard; Melde-Tuczai, Helmut; and Schukoff, Bruno, 4,428,338, Cl. 123-198.00E.

Schulz, Ralf-Thilo: *See—*
Engelsberger, Ernst; Schulz, Ralf-Thilo; and Drachenberg, Franz, 4,428,157, Cl. 49-502.000.

Schumperli, Walter, to Loepfe Brothers Limited. Electronic control device on a gripper shuttle weaving machine. 4,428,405, Cl. 139-341.000.

Schuster, Hans-Dieter: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Noller, Christoph, 4,428,347, Cl. 123-453.000.

Schwartz, Bertram: *See—*
De Loach, Bernard C., Jr.; Miller, Richard C.; and Schwartz, Bertram, 4,429,231, Cl. 250-551.000.

Schwarz, Gunter: *See—*
Beig, Willy; and Schwarz, Gunter, 4,429,196, Cl. 200-61.540.

Schwarz, Martin: *See—*
Mayer, Andreas; and Schwarz, Martin, 4,428,352, Cl. 123-559.000.

Schwarz, Richard A., to Cosden Technology, Inc. Expandable polymeric styrene particles. 4,429,058, Cl. 521-57.000.

Schweickhardt, Karl B.: *See—*
Sigetich, John D.; and Schweickhardt, Karl B., 4,428,159, Cl. 51-92.00R.

Schweikert, John F.; Grossman, David S.; and Durham, Edward E., to General Motors Corporation. Tip-in knock eliminating spark timing control. 4,428,343, Cl. 123-425.000.

Schweizerische Eidgenossenschaft, Vertreten durch die Eidg. Munitionsfabrik Thun der Gruppe fur Rustungsdienste: *See—*
Arni, Paul, 4,428,786, Cl. 149-21.000.

Schwellenbach, Donald D.: *See—*
Coggin, Michael E.; Everett, Charles K.; and Schwellenbach, Donald D., 4,428,090, Cl. 15-93.00C.

Schwenzfeier, Werner; and Kawa, Franz, to Voest-Alpine Aktiengesellschaft. Friction coupling and coupling sleeve. 4,428,737, Cl. 464-28.000.

Schwindt, Gary W.; and Wurster, Walter W., to Litton Systems, Inc. Body-carry electrical contact strips. 4,428,642, Cl. 339-276.0SF.

Scifres, Donald R.: *See—*
Sprague, Robert A.; and Scifres, Donald R., 4,428,647, Cl. 350-167.000.

Scintilla AG: *See—*
Holzer, Peter, 4,428,438, Cl. 173-48.000.

Scott Paper Company: *See—*
Isner, William G.; and Smoyer, John C., 4,429,014, Cl. 428-152.000.

Seecamp, Louis W. Double-action trigger mechanism with trigger-blocking magazine safety for firearms. 4,428,138, Cl. 42-70.00A.

Seeger, Friedrich, to Heyligenstaedt & Co. Werkzergmaschinenfabrik GmbH. Lathe. 4,428,109, Cl. 29-568.000.

Segal, David L.: *See—*
Cairns, James A.; Lane, Edward S.; Prentice, Thomas C.; Segal, David L.; and Sammon, David C., 4,428,864, Cl. 502-151.000.

Seibert, Willard J.: *See—*
Greenberg, Paul B.; Lenkeit, C. Heinz; and Seibert, Willard J., 4,428,189, Cl. 60-226.100.

Seid, Paul; and Wolf, Herbert, to Sultan Dental Products Limited. Disposable dental tray. 4,428,373, Cl. 604-77.000.

Seifert, Gary A.: *See—*
Powell, Walter W.; and Seifert, Gary A., 4,428,815, Cl. 204-297.00W.

Seike, Yasuhiko, to Sumitomo Heavy Industries, Ltd. Process for recovery of sulfur from SO_2-containing gas. 4,428,921, Cl. 423-569.000.

Seikosha Co., Ltd.: *See—*
Fujita, Masanori, 4,429,304, Cl. 340-765.000.

Seitz, James P., to NWL Transformers. Easily removable support assembly for a high voltage DC power supply. 4,429,347, Cl. 361-379.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Ozutsumi, Shunichi; and Yamamoto, Osamu, 4,429,059, Cl. 521-60.000.

Sella, Lino: *See—*
Bovio, Michele; Sella, Lino; Berruti, Pierangelo; Gillone, Walter; and Ceresa, Luciano, 4,428,693, Cl. 400-126.000.

Semco Instruments, Inc.: *See—*
Moore, M. Samuel; and Paluka, Charles F., 4,428,199, Cl. 60-600.000.

Sergeev, Jury S.: *See—*
Boyarina, Maya F.; Vildgrube, Vladimir G.; and Sergeev, Jury S., 4,428,856, Cl. 252-181.100.

Seto, Susumu: *See—*
Tokuhara, Mitsuhiro; Yamada, Yu; Takemura, Yukio; Kuwayama, Takeshi; and Seto, Susumu, 4,429,353, Cl. 362-232.000.

Seufert, Walter; Kiehs, Karl; Husslein, Gerd; Varwig, Juergen; Hamprecht, Gerhard; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Trifluoromethoxyphenyl-(di) thiophosphoric acid esters and their use in pest control. 4,428,944, Cl. 424-217.000.

Shaffer, Charles D. Mesh reinforced elastomeric element for oil well components. 4,428,592, Cl. 277-230.000.

Shah, Dhanendra C.: *See—*
McBroom, Kendall R.; and Shah, Dhanendra C., 4,428,834, Cl. 210-131.000.

Shankle, Arthur T., to Cain, Charles J. Electrode or pole piece array for creating prescribed electric or magnetic fields. 4,429,308, Cl. 340-870.370.

Shapiro, Wilbur, to Mechanical Technology Incorporated. Piston rod seal for a Stirling engine. 4,428,584, Cl. 277-3.000.

Sharashkin, Andrei M.: *See—*
Nikitin, Pavel Z.; Nemeni, Tibor M.; Zolotov, Lev A.; Bezchastnov, Gennady A.; Nikolsky, Alexandr I.; Sharashkin, Andrei M.; and Tjurin, Albert V., 4,429,244, Cl. 310-254.000.

Sharp Kabushiki Kaisha: *See—*
Masuzawa, Sigeaki; and Tanimoto, Akira, 4,429,182, Cl. 381-51.000.
Takino, Kenichi; and Murakami, Kenji, 4,428,729, Cl. 431-262.000.

Sharpee, Richard L.: *See—*
Bass, Edmund P.; and Sharpee, Richard L., 4,429,045, Cl. 435-235.000.

Sharrock, Barry: *See—*
Halliday, David P.; Riley, John F.; and Sharrock, Barry, 4,428,549, Cl. 244-1.00R.

Shedd, William D.; and Eschbach, Robert C., to Axelson Fishing Tackle Mfg. Co. Inc. Outrigger fishing clip. 4,428,142, Cl. 43-43.120.

Shedroff, Theodore L., to Lake Chemical Co. Solutions for use in bonding plates of storage batteries to connecting systems. 4,428,780, Cl. 148-23.000.

Shell Oil Company: *See—*
Bell, James P.; and Park, Jae M., 4,428,987, Cl. 427-327.000.
Davies, David R.; Richardson, Edwin A.; and Hagelaars, Adrianus M. P. M., 4,428,426, Cl. 166-276.000.
Drent, Eit, 4,429,150, Cl. 560-232.000.
Henning, Dean L.; Clark, Lewis M., III; and Ward, John M., 4,428,319, Cl. 114-253.000.
Kosters, Walter C. G., 4,428,829, Cl. 208-314.000.

Sheppard, Albert P., Jr.: *See—*
Birchfield, Jerry L.; and Sheppard, Albert P., Jr., 4,428,308, Cl. 110-229.000.
Sheptak, Nicholas, to American Can Company. Multi-ply laminae and identification card. 4,429,015, Cl. 428-201.000.
Sherwin-Williams Company, The: *See—*
Wagener, Anthony P., 4,428,844, Cl. 252-8.5LC.
Shibata, Fujio, to TDK Electronics Co., Ltd. High density magnetic recording medium. 4,429,010, Cl. 428-425.900.
Shibata, Yuzo; and Naganuma, Seikoh, to Mitsui Petrochemical Industries, Ltd. Ethylene/alpha-olefin copolymer composition. 4,429,079, Cl. 525-240.000.
Shidara, Tokihiko: *See—*
Kaneko, Takashi; and Shidara, Tokihiko, 4,429,399, Cl. 372-65.000.
Shim, Joosup: *See—*
Law, Derek A.; and Shim, Joosup, 4,428,855, Cl. 252-77.000.
Shimai, Hideo, to Yoshida Kogyo K. K. Apparatus for forming an element-free gap in a continuous slide fastener chain. 4,428,264, Cl. 83-465.000.
Shimano Industrial Company Limited: *See—*
Shimano, Keizo, 4,428,739, Cl. 474-231.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Roller chain. 4,428,739, Cl. 474-231.000.
Shimanuki, Senji; and Inomata, Koichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a multi-layer amorphous alloy. 4,428,416, Cl. 164-461.000.
Shimizu, Hirozumi; Kiso, Noboru; and Igarashi, Taizo, to Nippon Oil and Fats Co. Method of preventing dusts. 4,428,984, Cl. 427-220.000.
Shimizu, Masami: *See—*
Suzuki, Nobuyuki; and Shimizu, Masami, 4,428,655, Cl. 354-456.000.
Shimizu, Yasuo: *See—*
Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, 4,429,164, Cl. 568-377.000.
Shimizu, Yoshiaki, to Kabushiki Kaisha Komatsu Seisakusho. Piston for internal combustion engines. 4,428,330, Cl. 123-41.350.
Shin-Etsu Chemical Co., Ltd.: *See—*
Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,429,024, Cl. 428-694.000.
Shinden, Tetuya: *See—*
Honkawa, Tadashi; Takahata, Fujiya; Yagai, Koichi; Maeda, Yoshio; and Shinden, Tetuya, 4,429,230, Cl. 250-461.200.
Shinoda, Nobuhiko: *See—*
Sakai, Shinji; Shinoda, Nobuhiko; Kinoshita, Takao; Hosoe, Kazuya; and Kawabata, Takashi, 4,428,652, Cl. 354-407.000.
Shirako, Hideo; and Saito, Shoichi, to Olympus Optical Co., Ltd. Accessory for tape-cassette storage box. 4,428,479, Cl. 206-387.000.
Shirota, Kensho: *See—*
Suzuki, Shigeru; Fukuma, Daizo; and Shirota, Kensho, 4,428,785, Cl. 149-19.400.
Shirota, Norihisa: *See—*
Hashimoto, Yoshitaka; Shirota, Norihisa; and Yamamoto, Kaichi, 4,429,334, Cl. 358-310.000.
Shmelev, Arthur P.: *See—*
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SI Handling Systems, Inc.: *See—*
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Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,429,338, Cl. 361-42.000.
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Edwards, David G., 4,429,413, Cl. 382-4.000.
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Van Erden, Donald L.; Gould, Russell J.; and Matsunaga, Yukio A., 4,428,720, Cl. 425-66.000.
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Skala, Stephen F. Orifice band ink jet printer with ink confined by a counterpressure of air. 4,429,316, Cl. 346-75.000.
Skatsche, Othmar; Feichtinger, Gerhard; Melde-Tuczai, Helmut; and Schukoff, Bruno, to List, Hans. Internal combustion engine. 4,428,338, Cl. 123-198.00E.
SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,428,472, Cl. 192-98.000.
Skinner, Timothy J., to General Motors Corporation. Variable displacement compressor control valve arrangement. 4,428,718, Cl. 417-222.000.
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Smith, Harry A., to Dow Chemical Company, The. N, N-Bis (hydroxyalkyl) alkyl amides as phase separation inhibitors in liquid hydrocarbon and ethanol mixtures. 4,428,754, Cl. 44-56.000.
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Oelke, Erwin S., 4,428,588, Cl. 277-83.000.
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Smith, Robert E. Goggle with a renewable protective surface. 4,428,081, Cl. 2-438.000.
Smith, William. Apparatus for educational games. 4,428,582, Cl. 273-296.000.
Smither, Robert K., to United States of America, Energy. Instrument and method for focusing X-rays, gamma rays and neutrons. 4,429,411, Cl. 378-84.000.
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Sneider, Vincent R. Collapsible container with accordion pleated sidewalls, air vent and swivel valve outlet. 4,428,507, Cl. 222-105.000.
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Snitzer, Elias; and Wisnieff, Robert E., to United Technologies Corporation. Method of making fusible spacer for display panel. 4,428,764, Cl. 65-31.000.
Snow, Thomas K. Ignition and fuel control system for internal combustion engines. 4,428,349, Cl. 123-493.000.
Sobel, David D. Picture frame assemblies. 4,428,135, Cl. 40-155.000.
Societe Anonyme Diamant Boart: *See—*
Lambot, Honore J.; Fliervoet, Maria J. H.; and Kramer, Pieter, 4,428,602, Cl. 285-239.000.

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Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
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Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., 4,428,968, Cl. 426-49.000.
Societe Nouvelle de Bouchons Plastiques, S.N.B.P.: *See*—
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Solomon, Gary D. Plant watering and humidifying apparatus. 4,428,151, Cl. 47-81.000.
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Narimatsu, Akihisa; and Ohkubo, Hiroyuki, 4,429,276, Cl. 324-207.000.
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Sproul, William D.; and Tomashek, James R., to Borg-Warner Corporation. Rapid rate reactive sputtering of a group IVb metal. 4,428,811, Cl. 204-192.00R.
Sproul, William D., to Borg-Warner Corporation. Rapid rate reactive sputtering of metallic compounds. 4,428,812, Cl. 204-192.00R.
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Apperson, Kenneth P., 4,428,100, Cl. 24-115.00R.
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Li, George S., 4,428,776, Cl. 106-122.000.
Standard Oil Company (Indiana): *See*—
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Standiford, Ferris C., to Resources Conservation Co. Production of concentrated alcohol and distillery slop. 4,428,799, Cl. 203-19.000.
Stanier, Colin, to Imperial Chemical Industries PLC. Cladding cathodes of electrolytic cell with diaphragm or membrane. 4,428,813, Cl. 204-253.000.
Stanly, Albert L.; and Hyatt, Gilbert P. Electro-optical printer. 4,429,369, Cl. 364-710.000.
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Robbins, Jeffrey D., 4,428,888, Cl. 260-502.50F.
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Stenstrom, Craig A.; Holzhausen, Alan D.; and Stepp, Thomas R., Jr., to General Motors Corporation. Rack and pinion steering gear. 4,428,450, Cl. 180-148.000.
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Stephens, James R., to Standard Oil Company (Indiana). Poly[N,N'-(alkyl or aryl)-bis(4,4'-phthalimido)-1,3,4-oxadiazole-2,5-diyls]. 4,429,108, Cl. 528-322.000.
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Sterling, Gary P., to U.S. Peroxygen Company. Room temperature polymerization of acrylate monomers with peroxyesters. 4,429,092, Cl. 526-192.000.
Stermole, David A.; Loehr, Clifford E.; and Chun, Duk S., to PPG Industries, Inc. Method for separating particulate calcium hypochlorite and sodium chloride. 4,428,919, Cl. 423-474.000.
Stern, Carl M.; Maher, William M.; and Ventre, Michael T., to Quaker Oats Company, The. Inertia flywheel drive mechanism for a toy vehicle. 4,428,148, Cl. 46-40.000.
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Stokes, Richard F.; Timm, James D.; LaCroix, Stephen R.; and Adams, Milton R., to Garrett Corporation, The. Compressor bleed air control apparatus and methods. 4,428,194, Cl. 60-39.020.

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Stow, Mark, to Masco Corporation of Indiana. Battery retaining device. 4,429,025, Cl. 429-97.000.
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Street, Sidney W., to Hitco. Method of splicing reinforcement fiber. 4,428,992, Cl. 428-114.000.
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Sudo, Shigeru; and Yada, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Heating device. 4,429,210, Cl. 219-121.0LW.
Sugarman, Edward D. Limb positioning device. 4,428,571, Cl. 269-328.000.
Sugimori, Teruhiko; and Habara, Hideaki, to Mitsubishi Rayon Co., Ltd. Method for treating emulsified latex. 4,429,114, Cl. 528-486.000.
Sugimoto, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear magnetic resonance apparatus utilizing multiple magnetic fields. 4,429,277, Cl. 324-309.000.
Sugimoto, Mitsunori; and Nomura, Hidenori, to Nippon Electric Co., Ltd. Buried heterostructure laser diode. 4,429,397, Cl. 372-46.000.
Sugita, Ryuji, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium with vacuum deposited magnetic layer. 4,429,016, Cl. 428-692.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus capable of performing special reproduction. 4,429,335, Cl. 358-342.000.
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Sutter, S. R. Hydraulic motion conversion device for engines. 4,428,198, Cl. 60-595.000.
Sutton, James A., Jr. Emergency ventilation control apparatus for animal confinement house. 4,428,278, Cl. 98-33.00R.
Suzuki, Atsushi; Omori, Norio; Ninomiya, Masakazu; Akiyama, Susumu; and Hirabayashi, Yuji, to Nippondenso Co., Ltd. Method and system for operating an internal combustion engine at optimum torque. 4,428,342, Cl. 123-419.000.
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Suzuki, Osamu; and Nakamura, Keiji, to Nippon Electric Co., Ltd. Dot matrix printer head. 4,428,691, Cl. 400-124.000.
Suzuki, Shigeru; Fukuma, Daizo; and Shirota, Kensho, to Nissan Motor Co., Ltd. Binder for a polydiene composite propellant. 4,428,785, Cl. 149-19.400.
Svendsen, Lars G., to Pentapharm A.G. Tripeptide derivatives. 4,428,874, Cl. 260-112.50R.
Swartz, Robert G., to Bell Telephone Laboratories, Incorporated. Microwave transistor. 4,428,111, Cl. 29-576.00E.
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Swift Instruments, Inc.: *See*—
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Mittelmann, Gerhard; and Brodbeck, Klaus P., 4,428,491, Cl. 220-1.500.
Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Keve, Tibor; Dancsi, Lajos; Galambos, Janos; Vezekenyi, Feresc; and Acs, Tibor, 4,429,129, Cl. 546-70.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Cis-10-bromo-E-homoeburnanes. 4,428,877, Cl. 260-244.400.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Keve, Tibor; Dancsi, Lajos; Galambos, Janos; Vezekenyi, Ferenc; and Acs, Tibor, to Richter Gedeon Vegyeszeti Gyar Rt. 1α-Ethyl-1β-(2'-alkoxy carbonyl-2'-hydroxyiminoethyl)-10-methoxy 1,2,3,4,6,7,12,12β-octahydroindolo(2,3A)quinolizines. 4,429,129, Cl. 546-70.000.
Szekely, Istvan: *See*—
Tomoskozi, Istvan; Szekely, Istvan; Kanai, Karoly; Gyori, Peter; and Kovacs, Gabor, 4,429,123, Cl. 542-426.000.
Szende, Bela: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.
Szostak, Jan: *See*—
Patricia, John; and Szostak, Jan, 4,428,316, Cl. 112-323.000.
Szporny, Laszlo: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Schon, Istvan; Denes, Laszlo; Ember, Julia; Hajos, Gyorgy; Szporny, Laszlo; and Szende, Bela, 4,428,938, Cl. 424-177.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,428,877, Cl. 260-244.400.
Tack, Carl E., to TransDyne, Inc. Pedestal wear plate. 4,428,303, Cl. 105-225.000.
Tai, Masaru: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.
Takagi, Yoshihiro: *See*—
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Takahashi, Hiroshi: *See*—
Sato, Satoshi; Takahashi, Hiroshi; and Nakamura, Tsutomu, 4,428,793, Cl. 156-285.000.
Takahashi, Jun, to N H K Spring Co., Ltd. Safety device of a hinge. 4,428,095, Cl. 16-297.000.
Takahashi, Katsuhiro; and Yoshida, Toshio, to Takasago Perfumery Co., Ltd. 5-Methyl-2-(2'-oxo-3'-butyl)phenol and perfume compositions comprising same. 4,428,868, Cl. 252-522.00R.
Takahata, Fujiya: *See*—
Honkawa, Tadashi; Takahata, Fujiya; Yagai, Koichi; Maeda, Yoshio; and Shinden, Tetuya, 4,429,230, Cl. 250-461.200.
Takahata, Masahiro: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.
Takamatsu, Noboru, to Chikuma Apparel Co., Ltd. Slacks. 4,428,080, Cl. 2-227.000.
Takano, Toshio: *See*—
Kodama, Masayuki; and Takano, Toshio, 4,428,253, Cl. 74-688.000.
Takasago Perfumery Co., Ltd.: *See*—
Takahashi, Katsuhiro; and Yoshida, Toshio, 4,428,868, Cl. 252-522.00R.
Takasaki, Yukio; Hirai, Tadaaki; Yamamoto, Hideaki; Tsukada, Toshihisa; and Mori, Yoshiaki, to Hitachi, Ltd. Photosensor. 4,429,325, Cl. 357-31.000.

Takase, Sadao; Yamamoto, Akito; Oshiage, Katsunori; and Hosaka, Akio, to Nissan Motor Company, Limited. Digital control system for an internal combustion engine. 4,428,348, Cl. 123-480.000.
Takashita, Yutaka: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.
Takatsu, Yukihiro; Yamamoto, Shoichi; and Kamioka, Masaru, to Nisco Inc. Screw feed apparatus for use with a power screwdriving tool. 4,428,261, Cl. 81-434.000.
Takeda, Yukiyasu, to Sumitomo Light Metal Industries, Ltd. Apparatus for measuring internal stress of strip during rolling process. 4,428,244, Cl. 73-862.070.
Takei, Hirofumi, to Nissan Motor Co., Ltd. Engine mounting for automobile. 4,428,569, Cl. 267-140.100.
Takemura, Yukio: *See*—
Tokuhara, Mitsuhiro; Yamada, Yu; Takemura, Yukio; Kuwayama, Takeshi; and Seto, Susumu, 4,429,353, Cl. 362-232.000.
Takenaka, Shinya: *See*—
Yoshida, Kenichi; Ono, Kimizo; Sunago, Katsuyoshi; Takenaka, Shinya; and Iwai, Tohru, 4,429,392, Cl. 372-9.000.
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,428,274, Cl. 91-369.00A.
Taki, Hiroyuki; Mizuguchi, Hidenori; and Ota, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Combined parking and service brake system. 4,428,621, Cl. 303-13.000.
Takiguchi, Michitaka; Naganuma, Nobuyuki; and Horie, Fujio, to Brother Kogyo Kabushiki Kaisha. Electromechanical actuator for a sewing machine. 4,428,313, Cl. 112-220.000.
Takino, Kenichi; and Murakami, Kenji, to Sharp Kabushiki Kaisha. Discharge type ignitor for oil stove. 4,428,729, Cl. 431-262.000.
Tamai, Masayoshi; and Iyoda, Tetsuo, to Fuji Xerox Co., Ltd. Multinozzle ink jet printer. 4,429,315, Cl. 346-75.000.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; and Tamai, Yasuo, 4,429,017, Cl. 428-463.000.
Tanaka, Hideo: *See*—
Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, 4,429,164, Cl. 568-377.000.
Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Capacitance liquid level detector. 4,428,232, Cl. 73-304.00C.
Tanaka, Hisami: *See*—
Ito, Akihiko; Kobayashi, Kazuhiro; Tanaka, Hisami; and Ueno, Norio, 4,429,281, Cl. 330-9.000.
Tanaka, Keiji: *See*—
Sato, Tadashi; and Tanaka, Keiji, 4,428,664, Cl. 355-14.00R.
Tanaka, Kentaro: *See*—
Mito, Akio; and Tanaka, Kentaro, 4,428,398, Cl. 137-530.000.
Tanaka, Masato: *See*—
Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, 4,429,390, Cl. 371-40.000.
Tanaka, Teruaki: *See*—
Yanazawa, Tadaaki; Tanaka, Teruaki; Noda, Akio; and Morita, Takashi, 4,428,217, Cl. 72-250.000.
Taniguchi, Kozo, to Precision Fukuhara Works, Ltd. Carding drum for high pile circular knitting machines. 4,428,209, Cl. 66-9.00B.
Tanimoto, Akira: *See*—
Masuzawa, Sigeaki; and Tanimoto, Akira, 4,429,182, Cl. 381-51.000.
Tanimura, Nobuyoshi, to Hitachi, Ltd. Memory array addressing. 4,429,374, Cl. 365-230.000.
Tantardini, Paolo, to ATOS Oleodinamica S.p.A. Electrically and hydraulically actuated flow-distributing valve unit. 4,428,400, Cl. 137-625.610.
Taravella, Salvatore R.: *See*—
Brindley, Robert J.; Taravella, Salvatore R.; and Dean, Robert M., 4,429,214, Cl. 219-345.000.
Tarcy, Gary P., to Aluminum Company of America. Measurement of gaseous fluoride concentration using an internal reference solution. 4,428,800, Cl. 204-1.00T.
Tattersall, Edward G.; and English, Anthony J., to Vosper Hovermarine Limited. Fluid-cushion supported apparatus. 4,428,448, Cl. 180-128.000.
Tatum, John M.: *See*—
Cunningham, James L.; and Tatum, John M., 4,428,563, Cl. 266-113.000.
Tauscher, Robert, to Team Corporation. Vibrating test screening apparatus. 4,428,238, Cl. 73-663.000.
Taylor, Benjamin J.; and Lacy, Robert M., to Avery International Corp. Aqueous embrittling solution. 4,428,857, Cl. 252-193.000.
Taylor, Lionel I. A. Flowmeters. 4,428,243, Cl. 73-861.770.
TDK Electronics: *See*—
Sato, Atsushi; and Tsuyuki, Hiroshi, 4,429,346, Cl. 361-321.000.
TDK Electronics Co., Ltd.: *See*—
Shibata, Fujio, 4,429,010, Cl. 428-425.900.
Teagno, Vladimiro, to AMP Incorporated. Modular harness making method and apparatus. 4,428,114, Cl. 29-857.000.
Team Corporation: *See*—
Tauscher, Robert, 4,428,238, Cl. 73-663.000.
Technicare Corporation: *See*—
Robbins, C. Wayne; and Trimmer, William S. N., 4,428,379, Cl. 128-660.000.
Utenick, Michael R., 4,429,262, Cl. 318-254.000.
Tedd, David C.; and Gatland, Kenneth, to Thorn EMI Instruments Limited. Switch actuator mechanism. 4,429,202, Cl. 200-324.000.
Teegen, Walter: *See*—
Linder, Ernst; Rembold, Helmut; and Teegen, Walter, 4,428,195, Cl. 60-397.000.
Teijin Limited: *See*—
Norota, Susumu; Kiriyama, Tsutomu; Imoto, Tadashi; and Azumi, Toshinori, 4,429,006, Cl. 428-373.000.
Telefonaktiebolaget L M Ericsson: *See*—
Holm, Per I.; Nyberg, Karl F. L.; and Sodermark, Ulf A., 4,429,184, Cl. 179-18.0EE.
Telefunken Electronic GmbH: *See*—
Minner, Willy, 4,429,235, Cl. 307-356.000.
Temme, Karl: *See*—
Walther, Carl K.; Hageluken, Hubert P.; and Temme, Karl, 4,428,161, Cl. 51-163.200.
Teng, Harry H.; and Huang, I-Der, to Exxon Research & Engineering Co. Process for dehydrocoupling toluene using a modified faujasite zeolite catalyst composition. 4,429,174, Cl. 585-426.000.
Tenjin, Kaoru, to NEC Kansai, Ltd. Rotary pre-setting fine tuning device for a turret type television tuner. 4,429,291, Cl. 334-51.000.
Teplinsky, Anatoly D.; Jurchenko, Alexandr F.; and Yarovinsky, Grigory A. Apparatus for cleaning faced metal moulds of used facing. 4,428,414, Cl. 164-158.000.
Teramachi, Hiroshi. Recirculating-ball linear bearing. 4,428,627, Cl. 308-6.00C.
Terasawa, Koji: *See*—
Hattori, Yoshihumi; Terasawa, Koji; and Kasugayama, Yukio, 4,429,320, Cl. 346-140.00R.
Terrell, Jamie B., I; and Terrell, Jamie B., II, to Gearhart Industries, Inc. Chemical method and apparatus for perforating drill collars. 4,428,430, Cl. 166-298.000.
Terrell, Jamie B., II: *See*—
Terrell, Jamie B., I; and Terrell, Jamie B., II, 4,428,430, Cl. 166-298.000.
Teschendorf, Hans-Juergen: *See*—
Franke, Albrecht; Steiner, Gerd; Thieme, Peter C.; Lenke, Dieter; Gries, Josef; and Teschendorf, Hans-Juergen, 4,428,950, Cl. 424-250.000.
Testone, Anthony Q., to Static, Inc. Flow gauge ionizer. 4,428,230, Cl. 73-198.000.
Tetsuo, Terado: *See*—
Masaaki, Matsushita; and Tetsuo, Terado, 4,428,789, Cl. 156-85.000.
Texaco Inc.: *See*—
Jones, Henry B., 4,428,822, Cl. 208-76.000.
Levine, Stephen A.; Schlicht, Raymond C.; Chafetz, Harry; and Whiteman, James R., 4,428,848, Cl. 252-32.7HC.
Mazzagatti, Roy P., 4,429,273, Cl. 324-61.00R.
Zoleski, Benjamin H.; and Gaetani, Frank J., 4,428,850, Cl. 252-42.700.
Texas Instruments Incorporated: *See*—
Chapman, Richard A., 4,429,330, Cl. 358-113.000.
Textron Inc.: *See*—
Turansky, Clement J.; and LeBlanc, Gerard J., 4,428,188, Cl. 60-225.000.
Textured Products: *See*—
George, Stephen; and George, Thomas H., 4,428,999, Cl. 428-246.000.
Tezuka, Nobuo, to Canon Kabushiki Kaisha. Motorized driving device for camera. 4,428,657, Cl. 354-173.100.
Thiel, Alfons W., deceased; and by Thiel, Erika, heiress. Apparatus for stretching a continuously advancing synthetic-resin web and feeding same stepwise to a thermoforming machine. 4,428,723, Cl. 425-324.100.
Thiel, Erika, heiress: *See*—
Thiel, Alfons W., deceased; and Thiel, Erika, heiress, 4,428,723, Cl. 425-324.100.
Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,428,767, Cl. 11-95.000.
Thieme, Peter C.: *See*—
Franke, Albrecht; Steiner, Gerd; Thieme, Peter C.; Lenke, Dieter; Gries, Josef; and Teschendorf, Hans-Juergen, 4,428,950, Cl. 424-250.000.
Thomas & Betts Corporation: *See*—
Greenwood, William S., 4,428,638, Cl. 339-107.000.
Rich, Donald S., 4,428,632, Cl. 339-17.00C.
Weideman, Allen T., 4,428,546, Cl. 242-118.500.
Thomas, Dale C., to Xerox Corporation. Scanning beam detector. 4,429,218, Cl. 250-214.00R.
Thomas, Mark S.: *See*—
Thomas, Stephen E.; and Thomas, Mark S., 4,429,232, Cl. 290-1.00R.
Thomas, Stephen E.; and Thomas, Mark S. Apparatus for generating electricity within a pneumatic wheel assembly. 4,429,232, Cl. 290-1.00R.
Thompson, Michael O.: *See*—
Cichelli, Richard J.; and Thompson, Michael O., 4,429,385, Cl. 370-92.000.
Thompson, William E. Ball valve having improved seal means. 4,428,561, Cl. 251-174.000.
Thomson-CSF: *See*—
Clerc, Guy; and Shroff, Arvind, 4,429,250, Cl. 313-336.000.
Thorn EMI Instruments Limited: *See*—
Tedd, David C.; and Gatland, Kenneth, 4,429,202, Cl. 200-324.000.
Thorne, William D., to International Business Machines Corp. Band and hammer dot matrix printer. 4,428,284, Cl. 101-93.040.

Thorne, William D.: *See*—
Cole, Norman F.; and Thorne, William D., 4,428,285, Cl. 101-93.040.

Thrash, Tommy: *See*—
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,428,843, Cl. 252-8.50C.

Timken Company, The: *See*—
Folger, Russell F.; and Wasik, Henry J., 4,428,630, Cl. 308-187.200.

Timm, James D.: *See*—
Stokes, Richard F.; Timm, James D.; LaCroix, Stephen R.; and Adams, Milton R., 4,428,194, Cl. 60-39.020.

Tiollais, Pierre: *See*—
Galibert, Francis; Tiollais, Pierre; and Charnay, Patrick, 4,428,941, Cl. 424-177.000.

Tirel, Rene: *See*—
Deschatrettes, Gerard; and Tirel, Rene, 4,428,163, Cl. 51-237.00M.

Tjurin, Albert V.: *See*—
Nikitin, Pavel Z.; Nemeni, Tibor M.; Zolotov, Lev A.; Bezchastnov, Gennady A.; Nikolsky, Alexandr I.; Sharashkin, Andrei M.; and Tjurin, Albert V., 4,429,244, Cl. 310-254.000.

TMC Corporation: *See*—
Wittmann, Heinz; and Konwitza, Vladimir, 4,428,597, Cl. 280-626.000.

Tobisawa, Yoshio: *See*—
Masuda, Naosuke; Tobisawa, Yoshio; and Fujii, Tadaaki, 4,428,399, Cl. 137-625.220.

Toillie, Alain; and Rostoucher, Guy, to Kuhn S.A. Mower. 4,428,185, Cl. 56-295.000.

Tokico Ltd.: *See*—
Miura, Ieaki, 4,428,464, Cl. 188-315.000.

Tokiwa Kanpo Pharmaceutical Co., Ltd.: *See*—
Iwamura, Junichi, 4,428,876, Cl. 260-123.500.

Toko, Inc.: *See*—
Miyajima, Hajime, 4,429,246, Cl. 310-313.00B.

Tokuhara, Mitsuhiro; Yamada, Yu; Takemura, Yukio; Kuwayama, Takeshi; and Seto, Susumu, to Canon Kabushiki Kaisha. Scanning illuminating device. 4,429,353, Cl. 362-232.000.

Tokuhata, Kazuo: *See*—
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,429,197, Cl. 200-144.00B.

Tokyo Keiki Co., Ltd.: *See*—
Mito, Akio; and Tanaka, Kentaro, 4,428,398, Cl. 137-530.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Asakawa, Teruyoshi, 4,429,414, Cl. 382-30.000.
Kaneko, Takashi; and Shidara, Tokihiko, 4,429,399, Cl. 372-65.000.
Kato, Shunichi; and Aikawa, Tetsuo, 4,428,225, Cl. 73-65.000.
Kurii, Hajime, 4,429,368, Cl. 364-580.000.
Shimanuki, Senji; and Inomata, Koichiro, 4,428,416, Cl. 164-461.000.
Sudo, Shigeru; and Yada, Masaaki, 4,429,210, Cl. 219-121.0LW.
Sugimoto, Hiroshi, 4,429,277, Cl. 324-309.000.

Tokyo Shibaura Electric Company Limited: *See*—
Komeya, Katsutoshi; Inoue, Hiroshi; Matake, Shigeru; and Endo, Hiroshi, 4,428,916, Cl. 423-344.000.

Tolman, Richard L.; Marburg, Stephen; and Callahan, Lynn T., III, to Merck & Co., Inc. Bacterial toxoids and gram-negative immune globulin therefrom. 4,428,931, Cl. 424-87.000.

Tomashek, James R.: *See*—
Sproul, William D.; and Tomashek, James R., 4,428,811, Cl. 204-192.00R.

Tomb, Robert W.: *See*—
Plewes, John T.; and Tomb, Robert W., 4,428,779, Cl. 148-12.70C.

Tomer, Rex F. Permanent floral decoration. 4,428,168, Cl. 52-104.000.

Tominari, Noboru: *See*—
Ishida, Takashi; and Tominari, Noboru, 4,428,891, Cl. 261-65.000.

Tomoskozi, Istvan; Szekely, Istvan; Kanai, Karoly; Gyori, Peter; and Kovacs, Gabor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Preparation of 6-keto-7-oxo-$PGF_{1\alpha}$-derivatives. 4,429,123, Cl. 542-426.000.

Toray Industries, Inc.: *See*—
Fukada, Shunsuke; Aihara, Kiyoshi; and Ibaragi, Hideo, 4,429,002, Cl. 428-287.000.
Naka, Yasushi; and Kawakami, Kiyoshi, 4,429,000, Cl. 428-265.000.

Torii, Masakatsu. Massage device. 4,428,368, Cl. 128-38.000.

Torii, Shigeru; Tanaka, Hideo; Akada, Mitsuo; Masatomi, Tsunehiko; and Shimizu, Yasuo, to Otsuka Kagaku Yakuhin Kabushini Kaisha. Cyclohexadiene derivatives and process for preparing the same. 4,429,164, Cl. 568-377.000.

Toro, Andras I. Portable instant shade. 4,428,412, Cl. 106-23.00R.

Toscano, Luciano: *See*—
Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, 4,429,115, Cl. 536-7.200.

Toshiba Electric Equipment Corporation: *See*—
Inui, Kenichi; Kobayashi, Hisao; and Funabashi, Tadao, 4,429,356, Cl. 363-56.000.

Total Shooting Systems, Inc.: *See*—
Peck, Paul L., 4,428,459, Cl. 182-187.000.

Totoku Electric Co., Ltd.: *See*—
Sakai, Yoshio; and Yamada, Takeshi, 4,429,215, Cl. 219-528.000.

Tou, Jacob S.; and Schleppnik, Alfred A., to Monsanto Company. Method of producing mono-substituted terminal diesters. 4,428,887, Cl. 260-465.00D.

Toussaint, Herbert: *See*—
Goetz, Norbert; Jacobs, Peter; Hupfer, Leopold; Toussaint, Herbert; and Reiss, Wolfgang, 4,429,155, Cl. 564-402.000.

Toyabe, Toru: *See*—
Watanabe, Tomoyuki; Kaneko, Kenji; Nakamura, Tohru; Okada, Yutaka; Okabe, Takahiro; Nagata, Minoru; Itoh, Yokichi; and Toyabe, Toru, 4,429,326, Cl. 357-43.000.

Toyama Chemical Co., Ltd.: *See*—
Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.

Toyo Kogyo Co., Ltd.: *See*—
Yokooku, Katsuhiko, 4,428,355, Cl. 123-571.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Hirota, Kazumi; Tsutsumi, Yotaro; Itoh, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; Hori, Ichiro; and Hayashi, Toshihiko, 4,428,494, Cl. 220-270.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Masuda, Yoshimichi; Watanabe, Ryuzo; Imura, Shinichi; and Sakiyama, Kazutaka, 4,428,778, Cl. 148-11.50P.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,259, Cl. 74-867.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,428,258, Cl. 74-867.000.
Nomura, Yoshihisa, 4,428,613, Cl. 296-208.000.
Odogaki, Takaharu; Kawai, Hisasi; Matsui, Takeshi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,428,558, Cl. 251-65.000.

Tradt, Hans R., to Kuka Schweissanlagen & Roboter GmbH. Method of controlling an industrial robot. 4,429,266, Cl. 318-568.000.

Trafftrans (Proprietary) Limited: *See*—
Edwards, Christopher H., 4,428,990, Cl. 428-41.000.

Trans-World Manufacturing Corporation: *See*—
Franklin, Robert P., 4,428,136, Cl. 40-605.000.

TransDyne, Inc.: *See*—
Tack, Carl E., 4,428,303, Cl. 105-225.000.

Translift AG: *See*—
Mayer, Werner, 4,428,466, Cl. 191-58.000.

Translift Gesellschaft fur Hebe- und Forderanlagen mbH: *See*—
Mayer, Werner, 4,428,466, Cl. 191-58.000.

Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,428,387, Cl. 131-276.000.

Trevisan, Ottavio, to Furmanite International Limited. Apparatus for periodically testing the operation of safety valves. 4,428,223, Cl. 73-4.00R.

Trig International, Inc.: *See*—
Kronenberg, Klaus J., 4,428,837, Cl. 210-222.000.

Trimmer, William S. N.: *See*—
Robbins, C. Wayne; and Trimmer, William S. N., 4,428,379, Cl. 128-660.000.

Trinity University: *See*—
Doderer, Earl S., 4,428,205, Cl. 62-93.000.

Triplett, James T.: *See*—
Campbell, Bruce D.; and Triplett, James T., 4,428,115, Cl. 29-873.000.

Truskalo, Walter, to RCA Corporation. Television receiver power supply ferroresonant load circuit provided with a redundant operating capability. 4,429,260, Cl. 315-411.000.

Trybulski, Eugene J.: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,428,878, Cl. 260-245.700.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,428,879, Cl. 260-245.700.

Tsakiris, Nicholas G., to Wasco Products, Inc. Vaulted dome skylight. 4,428,169, Cl. 52-200.000.

Tsubota, Motohiko; Morigaki, Masakazu; Hamaoka, Tsutomu; and Ohki, Nobutaka, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic element. 4,429,031, Cl. 430-218.000.

Tsuchihashi, Kiyoshi: *See*—
Yasuda, Yutaka; Tsuchihashi, Kiyoshi; and Nishimura, Toshiro, 4,428,884, Cl. 260-404.500.

Tsukada, Toshihisa: *See*—
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United Technologies Corporation: *See—*
Botwin, Leo; and Simpson, John A., 4,428,293, Cl. 102-381.000.
Brown, Paul F., 4,428,628, Cl. 308-187.000.
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Neal, James W.; Sullivan, Joseph W.; and Loersch, Joseph F., 4,428,213, Cl. 72-53.000.
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van Manen, Dirk. Method of making socketed pipe-fittings of synthetic plastics material by injection moulding, apparatus for carrying out said method. 4,428,899, Cl. 264-249.000.
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Veltri, Douglas F. Lockable pocket-size tablet dispensing device. 4,428,502, Cl. 221-152.000.
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Verberne, Wim M. J. C.; and Eggels, Adriana G. M., to OMI International Corporation. Baths and processes for electrodepositing alloys of colbalt, tin and/or zinc. 4,428,803, Cl. 204-43.00Z.
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Wagener, Anthony P., to Sherwin-Williams Company, The. Compacted lost circulation material. 4,428,844, Cl. 252-8.5LC.
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Saikawa, Isamu; Yasuda, Takashi; Tai, Masaru; Takashita, Yutaka; Sakai, Hiroshi; Mae, Michiko; Takahata, Masahiro; and Mitsuhashi, Susumu, 4,428,936, Cl. 424-114.000.

Yasuda, Yukio; Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Hiratsuka, Nobuo, to Fuji Photo Film Co., Ltd. Competitive immunochemical measurement of plural trace components involving spectral sensitizing dye labels. 4,429,050, Cl. 436-538.000.

Yasuda, Yutaka; Tsuchihashi, Kiyoshi; and Nishimura, Toshiro, to Kao Soap Co., Ltd. Novel α-substituted carboxylamidoamine and process for producing the same. 4,428,884, Cl. 260-404.500.

Yasumura, Mitsuru: *See*—
Hata, Takehisa; Nishimura, Kenichi; and Yasumura, Mitsuru, 4,428,951, Cl. 424-250.000.

Yazawa, Satoru: *See*—
Hosokawa, Minoru; Oguchi, Koichi; and Yazawa, Satoru, 4,429,305, Cl. 340-784.000.

Yee, Bing S.: *See*—
Frank, Earl E.; and Yee, Bing S., 4,428,552, Cl. 246-393.000.

Yochum, Billy G.; and Keller, G. James, to Harris Corporation. Apparatus for determining and indicating the position of a movable member. 4,429,219, Cl. 250-229.000.

Yokono, Haruki; and Hiratsuka, Tsugihiko, to Hitachi Chemical Company, Ltd. Glass cloth and prepreg containing same. 4,428,995, Cl. 428-193.000.

Yokooku, Katsuhiko, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation control for internal combustion engines. 4,428,355, Cl. 123-571.000.

Yokoyama, Yoshihiro: *See*—
Kamon, Yoshoyuki; and Yokoyama, Yoshihiro, 4,429,194, Cl. 179-182.00R.

Yonezawa, Akira, to International Precision Incorporated. Transmission electron microscope. 4,429,222, Cl. 250-311.000.

Yonker, John H.; and Fisher, Ernest P., Jr., to Otis Engineering Corporation. Single line deep depth safety valve. 4,428,557, Cl. 251-62.000.

Yool, George M. Integrated antenna, amplifier and converter for microwave frequencies. 4,429,417, Cl. 455-291.000.

Yorkshire Imperial Plastics Limited: *See*—
Riley, Jack L.; Lock, Michael C.; and Goddin, Jeremy R., 4,428,900, Cl. 264-526.000.

Yoshida, Hajime, to Hajime Industries Ltd. Light diffusion device. 4,428,673, Cl. 356-240.000.

Yoshida, Kenichi; Ono, Kimizo; Sunago, Katsuyoshi; Takenaka, Shinya; and Iwai, Tohru, to Sumitomo Electric Industries, Ltd. Laser output controlling device. 4,429,392, Cl. 372-9.000.

Yoshida Kogyo K. K.: *See*—
Shimai, Hideo, 4,428,264, Cl. 83-465.000.

Yoshida, Mitsuo: *See*—
Higashi, Mitsuo; Morita, Jyun-ichi; Koyama, Kenzi; and Yoshida, Mitsuo, 4,429,021, Cl. 428-629.000.

Yoshida, Takao: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,428,387, Cl. 131-276.000.

Yoshida, Takashi, to Kabushiki Kaisha Takemi. Domino toppling toy. 4,428,147, Cl. 46-1.00R.

Yoshida, Toshio: *See*—
Takahashi, Katsuhiro; and Yoshida, Toshio, 4,428,868, Cl. 252-522.00R.

Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,429,335, Cl. 358-342.000.

Young, John A.; and Munson, Richard E., to Baker Oil Tools, Inc. Single pass filtration of oil or gas well completion fluids. 4,428,425, Cl. 166-267.000.

Young, Robert A., to Eaton Corporation. Transmission. 4,428,247, Cl. 74-331.000.

Youtsey, Karl J.: *See*—
Campbell, Bonnie J.; Counts, Thomas G.; Cunningham, James L.; and Youtsey, Karl J., 4,428,106, Cl. 29-157.30A.

Yuen, Kin S.: *See*—
Yuen, Yat C.; and Yuen, Kin S., 4,428,453, Cl. 181-231.000.

Yuen, Yat C.; and Yuen, Kin S. Exhaust silences for internal combustion engines. 4,428,453, Cl. 181-231.000.

Yurecko, John M., Jr.: *See*—
Eilerman, Robert G.; Willis, Brian J.; and Yurecko, John M., Jr., 4,428,870, Cl. 252-522.00R.

Yusa, Yasuhiro: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,429,335, Cl. 358-342.000.

Zachry, Clyde L., to Burroughs Corporation. Coil connector. 4,429,349, Cl. 361-414.000.

Zahnraderfabrik Renk A.G.: *See*—
Zaunberger, Franz X., 4,428,445, Cl. 180-6.440.

Zahnradfabrik Friedrichshafen AG: *See*—
Beig, Willy; and Schwarz, Gunter, 4,429,196, Cl. 200-61.540.
Lang, Armin, 4,428,449, Cl. 180-131.000.
Meyerle, Michael; and Ehrlinger, Friedrich, 4,428,257, Cl. 74-866.000.

Zahradnik, Anton F., to Hughes Tool Company. Floating seal for earth boring bit. 4,428,687, Cl. 384-94.000.

Zajac, Edward: *See*—
McCabe, Barkman C.; Zajac, Edward; and Featherstone, John L., 4,428,200, Cl. 60-641.500.

Zamerowski, Thomas J.: *See*—
Olsen, Gregory H.; and Zamerowski, Thomas J., 4,429,395, Cl. 372-45.000.

Zanchi, Vittorio: *See*—
Maccianti, Tiziano; and Zanchi, Vittorio, 4,429,361, Cl. 364-200.000.

Zander, Maximilian: *See*—
Zellerhoff, Robert; Zander, Maximilian; and Kajetanczyk, Franz, 4,429,172, Cl. 585-241.000.

Zang, Daniel M.; and Huber, John W., to General Motors Corporation. V-Type engine intake with vibration isolated manifold. 4,428,331, Cl. 123-52.0MV.

Zaunberger, Franz X., to Zahnraderfabrik Renk A.G. Tracked vehicle drive assembly. 4,428,445, Cl. 180-6.440.

Zeger, Andrew E.; Abrams, Burton S.; Rose, Joseph L.; Avioli, Michael J., Jr.; and Singh, Gurvinder P., to Electric Power Research Institute, Inc. System and method for measuring ultrasonic return signals. 4,428,237, Cl. 73-592.000.

Zellerhoff, Robert; Zander, Maximilian; and Kajetanczyk, Franz, to Rutgerswerke Aktiengesellschaft. Process for the production of modified pitches and low boiling aromatics and olefins and use of said pitches. 4,429,172, Cl. 585-241.000.

Zetting, Alois: *See*—
Wagli, Peter; Zetting, Alois; and Pfister, Gustav, 4,429,224, Cl. 250-342.000.

Ziegenfus, Barry L.; and Scheel, Russell, to SI Handling Systems, Inc. Vehicle precision stop assembly. 4,428,300, Cl. 104-250.000.

Zijlstra, Hinne: *See*—
Verweel, Jan; and Zijlstra, Hinne, 4,428,736, Cl. 445-47.000.

Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,429,167, Cl. 568-636.000.

Zoleski, Benjamin H.; and Gaetani, Frank J., to Texaco Inc. Low foaming railway diesel engine lubricating oil compositions. 4,428,850, Cl. 252-42.700.

Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, to Siemens Aktiengesellschaft. Method for the electrical stimulation of the auditory nerve and multichannel hearing prosthesis for carrying out the method. 4,428,377, Cl. 128-419.00R.

Zolotov, Lev A.: *See*—
Nikitin, Pavel Z.; Nemeni, Tibor M.; Zolotov, Lev A.; Bezchastnov, Gennady A.; Nikolsky, Alexandr I.; Sharashkin, Andrei M.; and Tjurin, Albert V., 4,429,244, Cl. 310-254.000.

Zopf, Richard F.: *See*—
Keane, John J.; and Zopf, Richard F., 4,429,034, Cl. 430-271.000.

Zscheile, John W., Jr.; and Bennett, Steven L., to Sperry Corporation. Random binary waveform encoded ranging apparatus. 4,429,310, Cl. 343-13.00R.

Zschiesche, Heinz: *See*—
Willenberg, Heinrich; Hellberg, Karl-Heinz; and Zschiesche, Heinz, 4,428,920, Cl. 423-465.000.

Zudkevitch, David; Belsky, Stephen E.; and Krautheim, Preston D., to Allied Corporation. Extraction and/or extractive distillation of low molecular weight alcohols from aqueous solutions. 4,428,798, Cl. 203-18.000.

Zupancic, Joseph J., to UOP Inc. Separation of saccharides. 4,429,122, Cl. 536-124.000.

Zwicker, Eberhard: *See*—
Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, 4,428,377, Cl. 128-419.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Agfa-Gevaert Aktiengesellschaft: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., Re. 31,514, Cl. 430-372.000.

Bayer Aktiengesellschaft: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

Buchel, Karl H.: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., Re. 31,514, Cl. 430-372.000.

Glen, Donald H. G. Blanching, pasteurizing and sterilizing process and apparatus suitable therefor. Re. 31,513, Cl. 426-521.000.

Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., to Agfa-Gevaert Aktiengesellschaft. Photographic material containing a stabilizer. Re. 31,514, Cl. 430-372.000.

Kabbe, Hans-Joachim: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

Metzger, Karl G.: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

Petersen, Uwe: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

Robbins Company, The: *See*—
Spencer, Barry A., Re. 31,511, Cl. 299-56.000.

Spencer, Barry A., to Robbins Company, The. Rotary cutterhead for an earth boring machine. Re. 31,511, Cl. 299-56.000.

Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, to Bayer Aktiengesellschaft. Pseudotrissaccharides, a process for their production and their use as medicaments. Re. 31,512, Cl. 424-180.000.

Voigt, Armin: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., Re. 31,514, Cl. 430-372.000.

von Konig, Anita: *See*—
Jager, Gerhard; von Konig, Anita; Voigt, Armin; and Buchel, Karl H., Re. 31,514, Cl. 430-372.000.

Voss, Eckart: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

Zeiler, Hans-Joachim: *See*—
Stadler, Peter; Metzger, Karl G.; Voss, Eckart; Petersen, Uwe; Zeiler, Hans-Joachim; and Kabbe, Hans-Joachim, Re. 31,512, Cl. 424-180.000.

LIST OF DESIGN PATENTEES

AGFA-Gevaert AG: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 272,448, Cl. D16-34.000.
Schlagheck, Norbert; and Rabold, Lutz, 272,449, Cl. D16-34.000.

Airway Industries, Inc.: *See*—
Davis, Michael; and Cassini, Oleg, 272,391, Cl. D3-71.000.

Aktiebolaget Gustavsberg: *See*—
Larsson, Erik, 272,473, Cl. D25-77.000.

American District Telegraph Company: *See*—
Thornton, H. Patrick; Dyer, Hugh D.; and Keeler, Frank R., 272,434, Cl. D13-35.000.
Thornton, H. Patrick; Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,435, Cl. D13-35.000.
Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,433, Cl. D13-35.000.
Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,436, Cl. D13-35.000.

American Standard Inc.: *See*—
Fisher, Michael D., 272,471, Cl. D25-74.000.
Flowers, Thomas S., 272,472, Cl. D25-74.000.
Stairs, Henry M., Jr., 272,464, Cl. D23-58.000.

Anderberg, Nils-Eric. Aircraft docking display. 272,423, 1-31-84, Cl. D10-114.000.

Angelakos, Nicholas P., to Lancaster Colony Corporation. Casserole. 272,404, 1-31-84, Cl. D7-17.000.

Ashmore, Mike J., to Atlas Investment Co. Container for octane booster fluid for internal combustion engines. 272,447, 1-31-84, Cl. D15-5.000.

Atlas Investment Co.: *See*—
Ashmore, Mike J., 272,447, Cl. D15-5.000.

Au, Albert K. H.: *See*—
Wong, Ka W.; and Au, Albert K. H., 272,443, Cl. D14-95.000.

Balling, Bruce G. Combined mobile storage cart and rack. 272,481, 1-31-84, Cl. D34-24.000.

Ballone, Michael P.: *See*—
McCloskey, Don R.; Grossman, Morris G.; Joffe, Richard M.; and Ballone, Michael P., 272,476, Cl. D26-46.000.

Barnes, Richard D., to Southern Imperial, Inc. Hanger bracket for use with a perforated panel. 272,414, 1-31-84, Cl. D8-363.000.

Beirise, Jean M.: *See*—
Cooss, John C.; and Beirise, Jean M., 272,438, Cl. D14-53.000.

Belgiojoso, Maria L., to Villeroy & Boch Keramische Werke KG. Ceramic tile unit. 272,474, 1-31-84, Cl. D25-80.000.

Bigelow, Frank S. Shim for front wheel drive vehicle. 272,392, 1-31-84, Cl. D8-354.000.

Black & Decker Inc.: *See*—
McCloskey, Don R.; Grossman, Morris G.; Joffe, Richard M.; and Ballone, Michael P., 272,476, Cl. D26-46.000.

Boudreaux, Mark D., to CPG Products Corp. Toy stackable bolt and nut assembly. 272,454, 1-31-84, Cl. D21-59.000.

British Castors Limited: *See*—
Screen, Stafford T., 272,416, Cl. D8-375.000.

Broyles, Wayne R.: *See*—
Minichillo, Ronald A.; and Broyles, Wayne R., 272,430, Cl. D12-203.000.

Bulgarelli, Timothy D.; and Stonecipher, John L., to United States Manufacturing Company. Prosthetic valve key. 272,468, 1-31-84, Cl. D24-99.000.

Burleson Airology Corporation: *See*—
Burleson, Maurice L., 272,469, Cl. D25-1.000.

Burleson, Maurice L., to Burleson Airology Corporation. Clean room. 272,469, 1-31-84, Cl. D25-1.000.

Burlington Industries, Inc.: *See*—
West, Haywood L., 272,397, Cl. D6-164.000.
West, Haywood L., 272,398, Cl. D6-165.000.

Burns, Patrick C., to P. C. Burns Pty. Limited. Golfer's tool. 272,461, 1-31-84, Cl. D21-234.000.

Carr, Peter B., to International Standard Electric Corporation. Telephone instrument body. 272,441, 1-31-84, Cl. D14-60.000.

Carroll Company: *See*—
Carroll, Franklin, 272,425, Cl. D11-125.000.

Carroll, Franklin, to Carroll Company. Novelty Christmas decoration. 272,425, 1-31-84, Cl. D11-125.000.

Case, Gerald L. Painter's pot hook. 272,415, 1-31-84, Cl. D8-373.000.

Cassini, Oleg: *See*—
Davis, Michael; and Cassini, Oleg, 272,391, Cl. D3-71.000.

Clanton, W. Porter, to Quaker Oats Company, The. Toy rake. 272,456, 1-31-84, Cl. D21-120.000.

Clanton, W. Porter, to Quaker Oats Company, The. Toy watering bucket. 272,457, 1-31-84, Cl. D21-120.000.

Continental Group, Inc., The: *See*—
Gruodis, Robert J.; Franz, William T.; and Hayes, Edward J., 272,418, Cl. D9-370.000.

Coons, John C.; and Beirise, Jean M., to Masco Corporation of Indiana. Combined telephone handset and base station therefor. 272,438, 1-31-84, Cl. D14-53.000.

Coronado, Hector M. Chair. 272,394, 1-31-84, Cl. D6-73.000.

Country Blues, Incorporated: *See*—
Kelley, Michael O., 272,428, Cl. D12-158.000.

CPG Products Corp.: *See*—
Boudreaux, Mark D., 272,454, Cl. D21-59.000.

Daleiden, Barnard: *See*—
Van Roeyen, Harry; and Wagner, Paul E., 272,479, Cl. D28-55.000.

Daleiden, David: *See*—
Van Roeyen, Harry; and Wagner, Paul E., 272,479, Cl. D28-55.000.

Davis, Michael; and Cassini, Oleg, to Airway Industries, Inc. Luggage case. 272,391, 1-31-84, Cl. D3-71.000.

Dellecave, Michael J.; and Klosterman, Jack L., Sr. Digital transfer switch with diagnostic display. 272,446, 1-31-84, Cl. D14-107.000.

Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 272,424, Cl. D11-107.000.

Dyer, Hugh D.: *See*—
Thornton, H. Patrick; Dyer, Hugh D.; and Keeler, Frank R., 272,434, Cl. D13-35.000.
Thornton, H. Patrick; Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,435, Cl. D13-35.000.
Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,433, Cl. D13-35.000.
Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,436, Cl. D13-35.000.

Eakin, Jesse W. Wire puzzle or similar article. 272,455, 1-31-84, Cl. D21-106.000.

Fairchild Industries, Inc.: *See*—
Marrujo, Ralph G., 272,402, Cl. D6-199.000.

Fisher, Michael D., to American Standard Inc. Molding. 272,471, 1-31-84, Cl. D25-74.000.

Fleminger, Irwin. Moveable toy bird. 272,458, 1-31-84, Cl. D21-160.000.

Flowers, Thomas S., to American Standard Inc. Molding. 272,472, 1-31-84, Cl. D25-74.000.

France Bed Co., Ltd.: *See*—
Masuda, Teruo, 272,466, Cl. D24-36.000.

Franklin, William E. Safety mail box. 272,483, 1-31-84, Cl. D99-33.000.

Franz, William T.: *See*—
Gruodis, Robert J.; Franz, William T.; and Hayes, Edward J., 272,418, Cl. D9-370.000.

Gibson, J. Scott, to Mitel Corporation. PABX Console. 272,439, 1-31-84, Cl. D14-58.000.

Grossman, Morris G.: *See*—
McCloskey, Don R.; Grossman, Morris G.; Joffe, Richard M.; and Ballone, Michael P., 272,476, Cl. D26-46.000.

Gruodis, Robert J.; Franz, William T.; and Hayes, Edward J., to Continental Group, Inc., The. Can. 272,418, 1-31-84, Cl. D9-370.000.

Harada, Toshio: *See*—
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Yamamura, Masamichi; Tanaka, Michio; and Harada, Toshio, 272,409, Cl. D7-351.000.

Haven, C. Paul, to Nationwide Lure Manufacturing Co., Inc. Fishing lure. 272,463, 1-31-84, Cl. D22-27.000.

Hayes, Edward J.: *See*—
Gruodis, Robert J.; Franz, William T.; and Hayes, Edward J., 272,418, Cl. D9-370.000.

Hedlund, Raymond J., to Kelsey-Hayes Co. Vehicle wheel. 272,431, 1-31-84, Cl. D12-211.000.

Hedlund, Raymond J., to Kelsey-Hayes Co. Vehicle wheel. 272,432, 1-31-84, Cl. D12-211.000.

Hennessy, Thomas F., to Lori Corporation. Reversible lock guard. 272,413, 1-31-84, Cl. D8-343.000.

Huang, Ch'eng-Ch'uan. Scissors. 272,410, 1-31-84, Cl. D8-55.000.

Interdica S.A.: *See*—
Kanoui, Joseph, 272,451, Cl. D16-117.000.
Kanoui, Joseph, 272,452, Cl. D16-117.000.

International Standard Electric Corporation: *See*—
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Joffe, Richard M.: *See*—
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Jones, Robert C. Lawn golf mallet. 272,459, 1-31-84, Cl. D21-210.000.

Kabushiki Kaisha Shinsei Industries: *See*—
Wada, Tokio, 272,453, Cl. D18-19.000.

Kanoui, Joseph, to Interdica S.A. Spectacles. 272,451, 1-31-84, Cl. D16-117.000.

Kanoui, Joseph, to Interdica S.A. Spectacles. 272,452, 1-31-84, Cl. D16-117.000.

Kates, Fred W., to Revlon, Inc. Display unit. 272,399, 1-31-84, Cl. D6-186.000.

Keeler, Frank R.: *See*—
Thornton, H. Patrick; Dyer, Hugh D.; and Keeler, Frank R., 272,434, Cl. D13-35.000.
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Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,433, Cl. D13-35.000.
Trabucchi, Beth A.; Dyer, Hugh D.; and Keeler, Frank R., 272,436, Cl. D13-35.000.

Kelley, Michael O., to Country Blues, Incorporated. Saddle bag cooler. 272,428, 1-31-84, Cl. D12-158.000.

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Hedlund, Raymond J., 272,432, Cl. D12-211.000.

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Klier, Hans V., to Olivetti Synthesis, S.p.A. Chair. 272,393, 1-31-84, Cl. D6-67.000.

Klosterman, Jack L., Sr.: *See*—
Dellecave, Michael J.; and Klosterman, Jack L., Sr., 272,446, Cl. D14-107.000.

Knickerbocker, Robert H.; and Pohl, Karl-Heinz, to Siemon Company, The. Telephonic equipment distribution panel stand. 272,437, 1-31-84, Cl. D14-52.000.

Kuemmerling GmbH, Firma: *See*—
Persch, Hanns, 272,400, Cl. D6-188.000.
Persch, Hanns, 272,419, Cl. D9-413.000.

Lancaster Colony Corporation: *See*—
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Larsson, Erik, to Aktiebolaget Gustavsberg. Pile shoe. 272,473, 1-31-84, Cl. D25-77.000.

LeRoue, Lloyd J. Telescoping fishing pole. 272,462, 1-31-84, Cl. D22-23.000.

Lori Corporation: *See*—
Hennessy, Thomas F., 272,413, Cl. D8-343.000.

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MacDougall, Alexander S. O. Putter head with bowed shaft. 272,460, 1-31-84, Cl. D21-217.000.

Marrujo, Ralph G., to Fairchild Industries, Inc. Tray unit for mounting on the backrest of an aircraft seat. 272,402, 1-31-84, Cl. D6-199.000.

Masco Corporation of Indiana: *See*—
Coons, John C.; and Beirise, Jean M., 272,438, Cl. D14-53.000.

Masuda, Teruo, to France Bed Co., Ltd. Multi-projection multi-hole roller for massaging and chiropractic therapy. 272,466, 1-31-84, Cl. D24-36.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
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Yamamura, Masamichi; Tanaka, Michio; and Harada, Toshio, 272,409, Cl. D7-351.000.

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Meade, Marilyn A. Apron. 272,389, 1-31-84, Cl. D2-227.000.

Minichillo, Ronald A.; and Broyles, Wayne R., to Kemberly, Inc. Step plate. 272,430, 1-31-84, Cl. D12-203.000.

Mitel Corporation: *See*—
Gibson, J. Scott, 272,439, Cl. D14-58.000.

Morrow, Woodrow T., to Woodmar Company. Clip on device for locking touch tone telephones. 272,440, 1-31-84, Cl. D14-59.000.

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Spamer, William S., to Mead Corporation, The. Display shelf. 272,401, 1-31-84, Cl. D6-191.000.
Stahel, Alwin J., to Drag Specialties, Inc. Motorcycle emblem or the like. 272,424, 1-31-84, Cl. D11-107.000.
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Belgiojoso, Maria L., 272,474, Cl. D25-80.000.
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Morrow, Woodrow T., 272,440, Cl. D14-59.000.
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Mikkelsens, Inc.: *See*—
Mikkelsen, James C., 5,184, Cl. 68.000.
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ISSUED JANUARY 31, 1984

NOTE—First number, class; second number, subclass; third number, patent number

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76 4,428,822
78 4,428,823
86 4,428,824
109 4,428,825
120 4,428,826
4,428,827
208 R 4,428,828
314 4,428,829

CLASS 209

211 4,428,830
253 4,428,831
350 4,428,832

CLASS 210

113 4,428,833
131 4,428,834
172 4,428,835
189 4,428,836
222 4,428,837
323.2 4,428,838
512.3 4,428,839
717 4,428,840
747 4,428,841
4,428,842

CLASS 211

119 4,428,486
126 4,428,487
181 4,428,488

CLASS 213

62 A 4,428,489

CLASS 215

1 A 4,428,490

CLASS 219

10.55 A 4,429,203
10.55 F 4,429,204
10.77 4,429,205
10.79 4,429,206
73.1 4,429,207
78.16 4,429,208
98 4,429,209
121 LC 4,429,211
121 LW 4,429,210
268 4,429,212
301 4,429,213
345 4,429,214
528 4,429,215
4,429,216

CLASS 220

1.5 4,428,491
3.94 4,428,492
20 4,428,493
270 4,428,494
288 4,428,495
300 4,428,496
339 4,428,497
367 4,428,498
462 4,428,500
470 4,428,499

CLASS 221

13 4,428,501
152 4,428,502
232 4,428,503

CLASS 222

55 4,428,504
64 4,428,505
80 4,428,506
105 4,428,507
153 4,428,508
4,428,509
180 4,428,510
309 4,428,511
402.15 4,428,512

CLASS 224

42.21 4,428,513
151 4,428,514
232 4,428,515
314 4,428,516
326 4,428,517

CLASS 225

103 4,428,518

CLASS 226

75 4,428,519
141 4,428,520
199 4,428,521

CLASS 227

8 4,428,522

CLASS 228

121 4,428,523
170 4,428,524

CLASS 229

41 R 4,428,525
92.8 4,428,526

CLASS 235

380 4,429,217

CLASS 236

34.5 4,428,527
46 R 4,428,528
49 4,428,529

CLASS 239

8 4,428,530
102 4,428,531
204 4,428,532
284 R 4,428,533

CLASS 241

18 4,428,534
35 4,428,535
52 4,428,536
101 B 4,428,537
298 4,428,538

CLASS 242

18 A 4,428,539
25 R 4,428,540
46.2 4,428,541
54 R 4,428,542
66 4,428,543
84.21 R 4,428,544
107.4 A 4,428,545
118.5 4,428,546
199 4,428,547
4,428,548

CLASS 244

1 R 4,428,549
93 4,428,550
137 R 4,428,551

CLASS 246

393 4,428,552

CLASS 248

157 4,428,553
415 4,428,554
459 4,428,555

CLASS 249

3 4,428,556

CLASS 250

214 R 4,429,218
229 4,429,219
236 4,429,220
256 4,429,221
311 4,429,222
342 4,429,223
4,429,224
353 4,429,225
363 S 4,429,226
367 4,429,227
374 4,429,228
396 ML 4,429,229
461.2 4,429,230
551 4,429,231

CLASS 251

62 4,428,557
65 4,428,558
129 4,428,559
149.1 4,428,560
174 4,428,561

CLASS 252

8.5 A 4,428,845
8.5 C 4,428,843
8.5 LC 4,428,844
8.8 4,428,846
32.7 E 4,428,847
32.7 HC 4,428,848
33.4 4,428,849
42.7 4,428,850
58 4,428,851
62.56 4,428,852
67 4,428,853
69 4,428,854
77 4,428,855
181.1 4,428,856
193 4,428,857
299.1 4,428,858
301.17 4,428,859
315.1 4,428,860
500 4,428,866
512 4,428,867
522 A 4,428,869
522 R 4,428,868
4,428,870
542 4,428,871
550 4,428,872
583 4,428,873

CLASS 256

17 4,428,562

CLASS 260

112.5 R 4,428,874
4,428,875
123.5 4,428,876
244.4 4,428,877
245.7 4,428,878
4,428,879
4,428,880
379 4,428,882
404.5 4,428,884
410.9 N 4,428,885
464 4,428,886
465 D 4,428,887
502.5 F 4,428,888
927 R 4,428,889

CLASS 261

29 4,428,890
65 4,428,891
99 4,428,892
122 4,428,893

CLASS 264

9 4,428,894
28 4,428,895
40.1 4,428,896
109 4,428,897
167 4,428,898
249 4,428,899
526 4,428,900

CLASS 266

113 4,428,563
246 4,428,564

CLASS 267

9 A 4,428,565
64.15 4,428,566
64.26 4,428,567
140 4,428,568
140.1 4,428,569
164 4,428,570

CLASS 269

328 4,428,571

CLASS 271

297 4,428,572
305 4,428,573
307 4,428,574

CLASS 272

8 R 4,428,575
33 R 4,428,576
135 4,428,577
136 4,428,578

CLASS 273

145 C 4,428,580
145 CA 4,428,579
153 S 4,428,581
296 4,428,582
348.1 4,428,583

CLASS 277

3 4,428,584
12 4,428,585
25 4,428,586
4,428,587
83 4,428,588
101 4,428,589
188 A 4,428,590
207 A 4,428,591
230 4,428,592
235 B 4,428,593

CLASS 280

242 WC 4,428,594
435 4,428,595
507 4,428,596
626 4,428,597
644 4,428,598
784 4,428,599
802 4,428,600

CLASS 285

197 4,428,601
239 4,428,602
321 4,428,604
368 4,428,603

CLASS 290

1 R 4,429,232

CLASS 292

152 4,428,605
181 4,428,606
201 4,428,607
247 4,428,608
251 4,428,609

CLASS 294

1 B 4,428,610

CLASS 296

66 4,428,611
97 K 4,428,612
208 4,428,613
224 4,428,614

CLASS 297

118 4,428,615
145 4,428,616
188 4,428,617

CLASS 299

1 4,428,618
56 Re.31,511
81 4,428,619

CLASS 303

3 4,428,620
13 4,428,621
84 R 4,428,622
114 4,428,623
116 4,428,624

CLASS 305

12 4,428,625

CLASS 307

87 4,429,233
350 4,429,234
356 4,429,235
362 4,429,236
450 4,429,237
465 4,429,238
520 4,429,239

CLASS 308

4 A 4,428,626
6 C 4,428,627
187 4,428,628
187.2 4,428,629
4,428,630

CLASS 310

45 4,429,240
51 4,429,241
71 4,429,242
4,429,243
254 4,429,244
261 4,429,245
313 B 4,429,246
322 4,429,247
370 4,429,248

CLASS 312

194 4,428,631

CLASS 313

113 4,429,249
336 4,429,250
411 4,429,251
414 4,429,252
573 4,429,253

CLASS 315

3 4,429,254
5.39 4,429,255
169.4 4,429,256
371 4,429,257
382 4,429,258
408 4,429,259
411 4,429,260

CLASS 318

6 4,429,261
254 4,429,262
4,429,263
466 4,429,264
475 4,429,265
568 4,429,266
594 4,429,267
696 4,429,268

CLASS 323

301 4,429,269
317 4,429,270

CLASS 324

60 CD 4,429,271
61 R 4,429,272
4,429,273
66 4,429,274
158 F 4,429,275
207 4,429,276
309 4,429,277

CLASS 328

129.1 4,429,278
139 4,429,279

CLASS 329

200 4,429,280

CLASS 330

9 4,429,281
4,429,282
257 4,429,283
261 4,429,284
279 4,429,285
286 4,429,286

CLASS 331

107 DP 4,429,287

CLASS 332

51 R 4,429,288

CLASS 333

204 4,429,289
241 4,429,290

CLASS 334

51 4,429,291

CLASS 335

202 4,429,292
211 4,429,293

CLASS 336

198 4,429,294

CLASS 337

119 4,429,295
338 4,429,296

CLASS 338

162 4,429,297
195 4,429,298

CLASS 339

17 C 4,428,632
17 CF 4,428,633
42 4,428,634
74 R 4,428,635
97 P 4,428,636
99 R 4,428,637
107 4,428,638
143 R 4,428,639
176 M 4,428,640
205 4,428,641
276 SF 4,428,642

CLASS 340

310 R 4,429,299
347 DD 4,429,300
365 S 4,429,301
572 4,429,302
701 4,429,303
765 4,429,304
784 4,429,305
790 4,429,306
870.37 4,429,307
4,429,308

CLASS 343

7 PL 4,429,309
13 R 4,429,310
18 E 4,429,311
410 4,429,312
771 4,429,313
788 4,429,314

CLASS 346

75 4,429,315
4,429,316
4,429,317
76 PH 4,429,318
108 4,429,319
140 R 4,429,320
4,429,321
4,429,322
153.1 4,429,323

CLASS 350

3.71 4,428,643
96.14 4,428,644
96.20 4,428,645
96.31 4,428,646

167 4,428,647
238 4,428,648
289 4,428,649
319 4,428,650
556 4,428,651

CLASS 354

80 4,428,656
173.1 4,428,657
310 4,428,658
317 4,428,659
403 4,428,653
407 4,428,652
413 4,428,654
456 4,428,655

CLASS 355

3 DD 4,428,661
3 FU 4,428,660
3 SH 4,428,667
4 4,428,662
14 R 4,428,663
4,428,664
14 SH 4,428,666
15 4,428,665

CLASS 356

17 4,428,668
39 4,428,669
71 4,428,670
144 4,428,671
237 4,428,672
240 4,428,673
4,428,674
347 4,428,675
354 4,428,676

CLASS 357

13 4,429,324
31 4,429,325
43 4,429,326

CLASS 358

12 4,429,327
88 4,429,328
100 4,429,329
113 4,429,330
124 4,429,331
143 4,429,332
293 4,429,333
310 4,429,334
342 4,429,335

CLASS 360

97 4,429,336
123 4,429,337

CLASS 361

42 4,429,338
93 4,429,339
96 4,429,340
117 4,429,341
152 4,429,342
286 4,429,343
303 4,429,344
315 4,429,345
321 4,429,346
379 4,429,347
399 4,429,348
414 4,429,349

CLASS 362

120 4,429,350
187 4,429,351
189 4,429,352
232 4,429,353
342 4,429,354
403 4,429,355

CLASS 363

56 4,429,356
68 4,429,357
4,429,358
132 4,429,359

CLASS 364

200 4,429,360
4,429,361
4,429,362
4,429,363
400 4,429,364
431.08 4,429,365
482 4,429,366
513 4,429,367
580 4,429,368
710 4,429,369
748 4,429,370
803 4,429,371
900 4,429,372
4,429,373

CLASS 365

230 4,429,374
240 4,429,375

CLASS 366

41 4,428,677
124 4,428,678
141 4,428,679
296 4,428,680

CLASS 368

21 4,428,681
238 4,428,682
250 4,428,683

CLASS 369

43 4,429,376
77.2 4,429,377
110 4,429,378
220 4,429,379
230 4,429,380
266 4,429,381

CLASS 370

80 4,429,382
84 4,429,383
85 4,429,384
92 4,429,385
100 4,429,386
110.1 4,429,387

CLASS 371

21 4,429,388
4,429,389
40 4,429,390
49 4,429,391

CLASS 372

9 4,429,392
21 4,429,393
34 4,429,394
45 4,429,395
4,429,396
46 4,429,397
64 4,429,398
65 4,429,399
95 4,429,400

CLASS 373

12 4,429,401
37 4,429,402
128 4,429,403

CLASS 374

25 4,428,684
163 4,428,685
179 4,428,686

CLASS 375

7o 4,429,404
89 4,429,405
113 4,429,406

CLASS 376

105 4,428,901
156 4,428,902
261 4,428,903
283 4,428,904
323 4,428,905

CLASS 377

7 4,429,407
8 4,429,408

CLASS 378

45 4,429,409
53 4,429,410
84 4,429,411
165 4,429,412

CLASS 381

51 4,429,182
99 4,429,181

CLASS 382

4 4,429,413
30 4,429,414

CLASS 384

94 4,428,687
208 4,428,688
296 4,428,689

CLASS 400

120 4,428,690
124 4,428,691
4,428,692
126 4,428,693
144.2 4,428,694
249 4,428,695

CLASS 403

168 4,428,696
344 4,428,697

CLASS 404

17 4,428,698

CLASS 405

50 4,428,699
119 4,428,701
128 4,428,700
202 4,428,702

CLASS 406

155 4,428,703

CLASS 408

156 4,428,704

CLASS 411

82 4,428,705

CLASS 414

24.5 4,428,706
24.6 4,428,707
275 4,428,708
412 4,428,709
590 4,428,710

CLASS 415

2 A 4,428,711
7 4,428,712
48 4,428,713
161 4,428,714
199.2 4,428,715

CLASS 416

157 R 4,428,716
186 R 4,428,717

CLASS 417

222 4,428,718
354 4,428,719

CLASS 419

4,428,906

CLASS 422

61 4,428,907
4,428,908
95 4,428,909

CLASS 423

10 4,428,910
16 4,428,911
132 4,428,912
262 4,428,913
265 4,428,914
312 4,428,915
344 4,428,916
350 4,428,917
465 4,428,920
473 4,428,918
474 4,428,919
569 4,428,921
588 4,428,922
4,428,923

CLASS 434

4 4,428,924
19 4,428,925
4,428,926
37 4,428,927
49 4,428,928
4,428,929
52 4,428,930
87 4,428,931
91 4,428,932
93 4,428,933
101 4,428,934
114 4,428,935
4,428,936
4,428,937
177 4,428,938
4,428,939
4,428,940
4,428,941
4,428,942
180 Re.31,512
211 4,428,943
217 4,428,944
222 4,428,945
236 4,428,946
243 4,428,947
244 4,428,948
245 4,428,949
248.51 4,428,883
250 4,428,950
4,428,951
251 4,428,952
263 4,428,953
4,428,954
267 4,428,955
270 4,428,956
4,428,957
272 4,428,958
274 4,428,959
4,428,960
4,428,961
4,428,962
275 4,428,963
309 4,428,964
311 4,428,965

CLASS 425

66 4,428,720
136 4,428,721
150 4,428,722
324.1 4,428,723
446 4,428,724
556 4,428,725

CLASS 426

3 4,428,966
28 4,428,967
49 4,428,968
53 4,428,969
385 4,428,970
521 Re.31,513
565 4,428,971
578 4,428,972

CLASS 427

3 4,428,973
44 4,428,974
94 4,428,975
96 4,428,976
120 4,428,977
150 4,428,978
162 4,428,979
4,428,980
195 4,428,981
202 4,428,982
213.34 4,428,983
220 4,428,984
230 4,428,985
309 4,428,986
327 4,428,987

CLASS 428

8 4,428,988
12 4,429,012
35 4,428,989
41 4,428,990
44 4,428,991
114 4,428,992
117 4,428,993
122 4,429,013
152 4,429,014
164 4,428,994
193 4,428,995
198 4,428,996
201 4,429,015
202 4,428,997
240 4,428,998
246 4,428,999
265 4,429,000
283 4,429,001
287 4,429,002
317.9 4,429,003
324 4,429,004
350 4,429,005
373 4,429,006
389 4,429,007
402.2 4,429,008
410 4,429,009
425.9 4,429,010
450 4,429,011
463 4,429,017
546 4,429,018
550 4,429,019
625 4,429,020
629 4,429,021
675 4,429,022
692 4,429,016
694 4,429,023
4,429,024

CLASS 429

97 4,429,025
152 4,429,026

CLASS 430

5 4,429,027
4,429,028
57 4,429,029
75 4,429,030
218 4,429,031
231 4,429,032
237 4,429,033
271 4,429,034
372 Re.31,514
402 4,429,035
405 4,429,036
499 4,429,037
510 4,429,038
534 4,429,039

CLASS 431

78 4,428,726
182 4,428,727
187 4,428,728
262 4,428,729

CLASS 432

3 4,428,730
247 4,428,731

CLASS 434

160 4,428,732
363 4,428,733

CLASS 435

7 4,429,040
58 4,429,041
119 4,429,042
167 4,429,043
220 4,429,044
235 4,429,045
253 4,429,046

CLASS 436

4 4,429,047
42 4,429,048
178 4,429,049
538 4,429,050

CLASS 440

75 4,428,734
76 4,428,735

CLASS 445

47 4,428,736

CLASS 455

164 4,429,415
211 4,429,416
291 4,429,417
314 4,429,418

CLASS 464

28 4,428,737
93 4,428,738

CLASS 474

231 4,428,739
242 4,428,740

CLASS 493

103 4,428,741
142 4,428,742

CLASS 501

12 4,429,051
135 4,429,052

CLASS 502

8 4,428,863
65 4,429,053
77 4,428,862
4,428,865
101 4,428,847
151 4,428,864
157 4,429,054
202 4,429,055

CLASS 518

700 4,429,056
710 4,429,057

CLASS 521

57 4,429,058
60 4,429,059
182 4,429,060
4,429,061

CLASS 523

118 4,429,062
176 4,429,063
213 4,429,064
223 4,429,065

CLASS 524

35 4,429,075
158 4,429,066
299 4,429,067
302 4,429,068
469 4,429,069
517 4,429,070
569 4,429,071
591 4,429,072
600 4,429,073
819 4,429,074

CLASS 525

57 4,429,076
143 4,429,077
165 4,429,078
240 4,429,079
415 4,429,080
420 4,429,081
426 4,429,082
439 4,429,083

CLASS 526

88 4,429,084
92 4,429,085
119 4,429,087
135 4,429,088
153 4,429,089
177 4,429,090
181 4,429,091
192 4,429,092
205 4,429,093
240 4,429,094
263 4,429,095
287 4,429,096
317 4,429,097

CLASS 528

59 4,429,098
98 4,429,099
128 4,429,100
172 4,429,102
176 4,429,103
206 4,429,104
207 4,429,105
216 4,429,106
318 4,429,107
322 4,429,108
331 4,429,109
348 4,429,110
395 4,429,111
422 4,429,112
486 4,429,113
4,429,114

CLASS 536

7.2 4,429,115
4,429,116
17.2 4,429,117
4,429,118
91 4,429,120
123 4,429,121
124 4,429,122
181 4,429,119

CLASS 542

426 4,429,123

CLASS 544

214 4,429,124
243 4,429,125
250 4,429,126
363 4,429,127
373 4,429,128

CLASS 546

70 4,429,129
167 4,429,130
251 4,429,131
346 4,429,132

CLASS 548

159 4,429,133
165 4,429,134
264 4,429,135
491 4,428,881

CLASS 549

258 4,429,136
259 4,429,137
282 4,429,138
356 4,429,139
4,429,144
370 4,429,140
382 4,429,141
394 4,429,142
450 4,429,143

CLASS 556

415 4,429,145

CLASS 560

21 4,429,146
81 4,429,147
118 4,429,148
124 4,429,149
232 4,429,150
261 4,429,151

CLASS 562

442 4,429,152
493 4,429,153

CLASS 564

278 4,429,154
402 4,429,155
412 4,429,156
446 4,429,157
455 4,429,158
492 4,429,159
505 4,429,160

CLASS 568

14 4,429,161
50 4,429,162
352 4,429,166
377 4,429,164
432 4,429,163
487 4,429,165
636 4,429,167
755 4,429,168
756 4,429,169
761 4,429,170
804 4,429,171

CLASS 585

241 4,429,172
331 4,429,173
426 4,429,174
433 4,429,175
481 4,429,176
525 4,429,177

CLASS 604

4 4,428,743
6 4,428,744
4,428,745
8 4,428,746
12 4,428,747
22 4,428,748
77 4,428,373

CLASS 700

72.4 4,428,461

CLASSIFICATION OF DESIGNS

D2—	227	272,389		106	272,406	D10—	71	272,421	D14—	52	272,437	D18—	19	272,453	D25—	1	272,469
	330	272,390		350	272,407		106	272,422		53	272,438	D21—	59	272,454		18	272,470
D3—	71	272,391		351	272,408		114	272,423		58	272,439		106	272,455		74	272,471
D6—	67	272,393			272,409	D11—	107	272,424		59	272,440		120	272,456			272,472
	73	272,394	D8—	55	272,410		125	272,425		60	272,441			272,457		77	272,473
	83	272,395		331	272,411		158	272,426		63	272,442		160	272,458		80	272,474
	86	272,396		343	272,412		162	272,427		95	272,443		210	272,459	D26—	24	272,475
	164	272,397			272,413	D12—	158	272,428		106	272,444		217	272,460		46	272,476
	165	272,398		354	272,392		190	272,429			272,445		234	272,461		87	272,477
	186	272,399		363	272,414		203	272,430		107	272,446	D22—	23	272,462		101	272,478
	188	272,400		373	272,415		211	272,431	D15—	5	272,447		27	272,463	D28—	55	272,479
	191	272,401		375	272,416			272,432	D16—	34	272,448	D23—	58	272,464		78	272,480
	199	272,402	D9—	354	272,417	D13—	35	272,433			272,449	D24—	33	272,465	D34—	24	272,481
	247	272,403		370	272,418			272,434		102	272,450		36	272,466		34	272,482
D7—	17	272,404		413	272,419			272,435		117	272,451		64	272,467	D99—	33	272,483
	102	272,405		424	272,420			272,436			272,452		99	272,468			

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